

# Does Sickness Compensation Matter for Economic Inequality?

*-A Counterfactual Analysis*

**Hannah Kristina McMurray**



Department of Economics

University of Oslo

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## Forword

This master thesis considers the impact of reducing sickness compensation on the degree of economic inequality. I would like to express a sincere appreciation to my supervisor, Simen Markussen for the idea, academic input and invaluable assistance. Your previous work provided a rich source of information and your good advice helped transform the initial drafts into the final result.

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I take complete responsibility for any mistakes and unclear content.

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## 1. Introduction

Norway stands alone in guaranteeing full sick leave compensation from the very first day of illness. These payments cover a sick leave rate of 7 percent and amount to 2.4 percent of Norway's GDP (Markussen et al, 2009). The economical and social consequences of such an insurance provision constitute an important topic of discussion for all involved –the ill individual, the employer and the government. Most of today's focus centers on the rate of sick leave, its duration and associated costs. Sick leave costs in the terms of actual benefits paid, lost productivity and possible personal career-related loss. But it also provides economic freedom for the ill and for those often so. The ideal of equal opportunity for all provides much of the basis for the right to full sickness insurance. As Markussen et al (2009) state in their paper, reform of the fundamental characteristics of sick leave insurance rarely arises as a much considered option, despite its established disincentive on work effort. They conclude that “apparently, the welfare gains associated with income security and equality are considered sufficient to justify the costs arising from a higher level of absenteeism” (Markussen et al., 2009). The question then arises whether the provision of sickness insurance actually functions as a means of achieving greater economic equality.

The study conducted here follows the economic developments for a sample of men over a given time period with the intent of quantifying the extent to which sickness insurance matters as an instrument in the social welfare aim of equality. I utilize register data from 1993 to 2005 to select the population, gather information on their total incomes, sick leave and received benefits. The entire population consists of all men thirty years of age in 1993, still alive and living in Norway in 2005. I also consider a sub-selection of the population containing only the men who have worked all thirteen years. Their yearly total incomes include the monetary value of all job and health related developments -of which the sick-leave pay remains the primary interest. By changing the percentage of compensation received from full to partial,

the new and fictional total incomes display the effect this has upon each individual's summed income. This assumes all behavioural decisions remain the same in both situations, which although highly unlikely realistically, it produces a ceiling value in the event of such a change. With lower compensation levels individuals would possibly opt for fewer absences not more, and thus the total income changes presented here provide a maximum.

The main purpose concerns the comparison of economic inequality for various levels of compensation –from 100 to 80 or 0 percent. As a result, inequality measurements over income distributions before and after provide an upper boundary of the possible differences. The method of determining its importance involves finding the changes in an inequality measure as a result of changes in the degree of compensation. I use the Gini coefficient and ratios of the incomes for certain percentiles of the populations to quantify the extent inequality increases. Following the economic impacts on individual incomes, these measurements capture the magnitude of the effect of lessened sick leave benefits on the resulting income distributions.

The results point to the relatively little impact of reduced sickness benefits on the population's economic inequality. Incomes fall slightly amongst both the entire population and the employed. The income losses with eighty percent compensation are distributed in such a way that the Gini measurement of inequality rises by 0.12 and 0.60 percentage points respectively. In the case of zero compensation the Gini rises to a maximum of 0.83 and 1.06 percentage points. The impact on different sections of the population reveal that the incomes of the bottom ten percent of the population register much of this loss in comparison to the upper half and tenth percentiles. As reflected in the Gini, the losses impact relatively few of the population substantially.

Apparently, sickness compensation does not play as influential a role in determining the level of equality as often expected. This means that given the effects of sickness benefits on work incentives, reforming the fundamental provision could serve as a means of both reducing sick leave and lowering its costs.

The next section gives a brief description of sickness insurance: the underlying reasons for its provision and impact of its degree of coverage on incentives. Given the interaction between benefits, I then provide an overview of the welfare benefits in Norway relevant for this study. Sickness benefits as a welfare benefit took nearly 100 years to develop and both its history and developments result in the key characteristics of its provision. Yet, the extent of sick leave and its associated costs present the need for possible reform. Here enters the possibility of reduced compensation and the advantages and disadvantages of such a change. Of these, the focus of this paper centers on its supposed contradiction with the aim of equality. In order to analyse this main argument against such a fundamental change in its provision, I first present the methods and data used. Determining the effect on inequality depends on describing both that already existing and the population regarded. Performing the analysis results in the conclusions as presented along with ideas for further discussion.





## **2. A General Perspective on Sickness Insurance**

There exist many perspectives on the words sick leave and benefits underlying the concept of sickness insurance. A good, a cost and a basic right with a reach and importance as determined by its admittance criteria, means of provision and generosity. The provision of sickness benefits constitutes a form of insurance against the risk of falling ill. For a country with a high rate of sick leave, sickness payments not only constitute a major benefit for the recipient but a major cost for the provider. Reforming sick leave insurance requires both a consideration of the impact it has on the intended purpose and the rate of illness.

From an economic perspective there exist two factors influencing an individual's view of sick leave insurance –labor supply and risk management. The first results in a deterministic form of absence decided by the employee who utilizes an absence in order to adjust actual working time –assuming the existence of imperfect employment contracts. The latter approach addresses the uncertainty of becoming ill, an individual's risk aversion and subsequent need for insurance.

### **2.1 Insurance in Times of Sickness**

The present, possible or eventual need for sick leave in the event of illness appears clearly but to which extent remains highly uncertain and variable. Despite preventative action, the random event of illness can occur at any time. The unsought risk associated with ill health constitutes a major concern for any individual regardless of background or economic standing. Markussen et al (2009) find that while personal characteristics such as age, gender, social background, family situation, education and occupation matter in determining individual sick leave, unobservable differences explain nearly two thirds of the variance in absentee rates between individuals. Just as there possibly exists a “natural rate of sickness” (Pedersen, 1997) for the population, individuals also have an “intrinsic absence

propensity” (Markussen et al, 2009) resulting in determinable average absence rates over time. Still, the uncertainty surrounding general health and well-being opens the door for a risk-adverse individual to desire insurance against the negative monetary outcomes associated with illness, injury or eventual handicaps. An insurance against the sudden loss of income, prolonged disability of earning or an inability to do so again provides at least a degree of financial security amongst varying degrees of emotional and physical difficulties.

### **2.1.1 Private Market Provision**

In a purely competitive market solution, the individual could buy insurance through a private provider at a price determined on the market. Individual purchasing decisions then imply a direct consideration of monetary cost and evaluation of the personal benefit attained through risk sharing. A nation with a heterogeneous population contains individuals with different preferences over insurance levels and needs. Permitting the private market to fulfil the role as insurer rather than the public sector allows for a more competitive supply. As in accordance with market theory this creates the possibility of greater production efficiency.

A group contains a wide spectrum of individuals differing according to characteristics affecting their predisposition for sick leave. With observable traits, the insurer could distinguish between those posing the greatest and least risk of becoming ill. Offering contracts dependent upon an individual’s level of risk then results in a set of contracts separating the two groups. With unobservable risk, the lack of knowledge regarding an individual’s health and inherent characteristics creates an informational and pricing quandary for the insurance provider. Should the insurer still offer separating contracts the high-risk group would optimally choose that belonging to the low risk group. A high risk individual would have little reason to reveal their true characteristics when the opportunity exists to pose as a low risk individual and obtain more favorable insurance terms. This characterizes the classical problem of adverse selection. Such contracts imply large losses for the insurer who might then offer a

pooling contract based on an average probability of sickness instead. However, this would result in an unstable competitive market solution in that another insurer could attract all the low risk individuals by offering a different and more appealing contract. The presence of imperfect information forces insurance providers to offer plans constructed in such a way that individuals have the proper incentives to choose the one classifying their risk. It would then become possible to distinguish the individual bearing the risk of higher absences and costs from those more unlikely to require such expenses.

Additionally, given the changing nature of sickness over time and age the contracts would most likely occur on a yearly basis. The insurance provider has little to gain from offering long-term contracts. Yearly contracts would provide the opportunity to adjust the terms according to health related developments. The continuous revelation of disadvantageous information could result in an unfavorable outcome for the ill or hereditary unfortunate. Such individuals could experience great difficulties in obtaining insurance or face excessively high premiums. If drawn to the extremes such a situation would lead to a collapse of the insurance market or at least a functioning far different from the intended. Sickness insurance might then only cover the continuously healthy in least need of such a provision.

A similar situation could arise in the case of complete employer provision of sickness insurance. Economic considerations might result in an unwillingness to hire individuals with a tendency to illness –as based upon previous history or known disabilities. A firm reluctant to hire those most likely to incur high sickness rates could lead the exclusion of those disadvantaged health-wise from the labour market. Furthermore, those already employed could face the extra pressure of working when sick in order to avoid being classified as a high risk individual. The resulting lower utilization of sick days amounts to a further deviation from the intended coverage.

### **2.1.2 Public Provision**

Public provision of mandatory and fully encompassing sickness insurance avoids the possible dangers of adverse selection in that all agents fall under the same coverage plan and pay contributions according to the same rules –regardless of health conditions and its possible changes over time. Given the imperfections of the private capital and insurance markets, its correction presents an “efficiency enhancing” effect (Lindbeck, 1997). With public provision of sickness insurance lessening the possibility of great financial loss, taxes serve as the public premium. This assumes the general willingness of an individual to pay this price for the resulting economic security. The government then bears the risk and plays the role as insurer for a risk-averse population. This does not however exclude the possibility of sharing the financial burden of this coverage with the employer.

The partial privatization of sick leave insurance refers to a sharing of the administrative and financial aspects of sick leave coverage with the employer. The insurance system itself remains fully determined by the legal rules agreed upon in the Parliament. The employers thus have no leeway in adjusting the insurance they offer their employees as with purely private alternatives –except for possibly providing greater coverage. Responsibility for part of the financial burden encourages employers to combat sick leave by for example providing a well-functioning work environment but at the same time grants them the economic incentive to avoid employees with ill-health.

Further reasons for public provision of sickness insurance stated by Poterba (1994) include: strategic behaviour of certain individuals in taking too much risk or not enough precautions in anticipation of eventual government assistance, irrationality concerning faulty assessment of risk and its consequences and lastly equity considerations in that tax-financing provides an indirect means of income redistribution.

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Sick leave benefits insure against the risk of becoming ill, but their use depends on both the reasons for illness and the correlation between the disincentive to work and its generosity. The payments not only cover a possibly unforeseen event but can contribute to the rate of its occurrence. The benefits play a two-fold role in forming both the conceptions surrounding sickness and the population's inclinations to be so.

## 2.2 The Degree of Insurance Coverage

The concept of generosity concerns to which extent the economic situation of the individual before, during and after an illness should differ. The greater the generosity of the benefit system the lesser the variation in income according to changes in health status. The trade-off between working and absences not only depends on a personal evaluation of health but the economic consequences. This gives rise to a further trade-off in policy making "between providing insurance for temporary health deficiencies and disincentive effects on work effort" (Johansson and Palme, 2005). Thus much focus centers on the degree of generosity and its effects upon incentives.

An individual's incentives arise in the interaction between preferences and constraints. Income and price constraints determine the feasibility of the choices. Personal preferences then decide the optimal choice. But while preferences remain difficult to measure beyond their ordinal valuations, the quantification of constraints occurs more easily. Thus, the economical constraints of illness or lack thereof can have substantial influence an individual's preference for sickness absences.

An important aspect characterizing the health-related insurance markets, such as sickness insurance, pertains to the direct relation between the costs of sickness and characteristics of the buyers. Those who draw the lucky card of good health will most likely, *ex ante*, have little use for generous benefits. Or at least lower valuations in comparison to those who already know that their health conditions require a certain level of insurance. A population naturally contains individuals differing in health conditions for a variety of uncontrollable or personally responsible reasons –such as

hereditary background or behavioural decisions. Should the insured individual's behavior remain unknown, this gives rise to a problem often referred to as moral hazard. Moral hazard describes a situation where an individual no longer has the incentive to take proper preventative action against becoming ill when he neither bears the consequences nor accounts for his lack of effort. As stated by Ragnar Frisch on the Department of Economics notice board at the University of Oslo in 1962, "Regarding the high absence rate at the Department: Acquiring minor diseases, such as colds or flu, is an act of choice."

The problem of moral hazard arises with unobservable levels of effort and the resulting asymmetrical information. The individual personally knows what steps he takes to avoid becoming ill, but not the insurance provider. Yet, the insurer can influence the insured's incentives and subsequent behavior through the choice of compensation level. According to Johansson and Palme (2005), "the extent to which insured workers adapt their work absence behavior, and their work effort, to the generosity of the sickness-insurance scheme constitutes the classical welfare state dilemma of moral hazard." Standard economic analysis would say that the optimal level of compensation should fall below the full in order to preserve work incentives. Optimal insurance with the presence of moral hazard often results in some form of a deductible in order to provide an incentive to undertake prevention.

The development of moral hazard with sickness insurance mainly arises in two forms – ex ante and ex post. These result in, respectively, a reduction in preventative actions or increases in demand for sick leave days. Ex ante moral hazard may exist in that individuals have less incentive to take preventative action in regards to their need for sick leave. Ex post moral hazard refers to the situation after an illness has incurred and the incentive to take a greater number of absences than actually needed when not bearing the full costs. Burdick (2008) mentions however that a weakness lies in that the doctor ultimately holds the authority in deciding approval of long-term leave –not the patient. Zweifel and Manning (2000) draw a further distinction between static and dynamic ex post moral hazard. The introduction of a dynamic

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dimension allows for the continuous development of new medical technologies and the possible increased demand for using them. In the presence of sickness insurance, individuals may then have an incentive to request health measures requiring the newly developed procedures as that the sick days required for recovery do not bear an immediate monetary cost. This could lead to a further amplification of the moral hazard problem.

The presence of full sick leave benefits drastically reduces the personal monetary cost of illness. Imagining sick leave as a normal consumption good allows for standard weighing of trade-offs between its benefit and cost. Without income reimbursement the good, sick leave, carries its full price in terms of lost income. One then weighs the benefit of staying home against the cost it bears. The optimal number of sick leaves occurs at the level where the marginal benefit equals the marginal cost. Higher levels of generosity lower the marginal cost and thus naturally lead to a greater number of sick days taken. Sickness insurance as a normal consumption good implies increased demand when the price falls but to what extent?

Here enters the importance of price elasticity of demand in determining the magnitude of the moral hazard problem. Price elasticity of demand in this context refers to the change in the utilization of sick leave days as the monetary cost of being sick falls. A generous insurance system lowers the cost of sickness absences. Should this have little effect on the individual's demand for sickness insurance then overuse of sick leave days presents little concern. However, a high price elasticity of demand implies that the use of sick leave greatly depends on its cost exacerbating the moral hazard problem. Markussen et al (2009) found that the required transition to less generous rehabilitation after fully utilized sick leave increases the probability of returning to work from 5 to 30 percent in the last possible weeks of sickness insurance benefits. The prospect of rehabilitation with its lower compensation clearly appeals less than returning to full-waged work. The degree of compensation clearly has a significant impact on the economic incentives of the sick individual. Should the sick level depend on its associated price, reduced compensation level would most



likely decrease the number of incidences. This however leads to the observation that with high prices the subsequent avoidance of absences by opting out on utilizing sick leave can lead to greater costs in the future. Such behaviour could result in prolonged absences due to illness of a more serious kind and more expensive treatments.

There will always exist individuals with a health status making them insensitive to economic incentives (Andre, 2003) but generally speaking receiving full compensation entails a strong disincentive effect on the desire to work and an increased incentive towards voluntary absenteeism for short spells. Of all the welfare provisions, sick leave insurance provides an individual with greatest opportunity for “strategic economically motivated behaviour, especially in regards to short-term illness.” (NOU 2000:27) The challenge then becomes balancing the level of risk sharing against the incentive distortions arising with such an insurance provision.

A number of studies have shown the relationship between high levels of generosity and weakened work incentives. A report done by SINTEF (2006) found that the countries with the most generous sick leave benefits also have the highest absence levels. A study by Daniela Andren (2003) analysing the impacts on individual behaviour of changes in the Swedish compensation system found that these economic determinants played an important role in determining the time patterns of sick spells. The regime changes in 1987 and 1991 resulting in reduced levels of sick leave compensation served to lower absence duration. Henrekson and Persson (2004) also come to a similar conclusion but point out that other behavioural responses, such as increased tendencies to retire early or working when actually ill, can serve to counteract these results. Klaus Rikner (2002) points out that without full compensation, sick leave costs the employee in terms of lost income. In light of this he may choose to call the sick leave in as another type of absence, such as a holiday, instead. Some also argue for a possible “draining” (Pedersen, 1997) of the labour market in that only the healthy choose to remain while the very ill choose to apply for disability benefits instead.

The generosity of sickness insurance not only affects the number of its own recipients but interacts further with other welfare benefits such as rehabilitation and disability. A health-related exit from the labor market often begins with fully utilizing the allowed year-long sick leave. Yet the effects can run the opposite way as well. The reduced generosity of the other benefits can lead to increased use of sick leave and a “build up” (Pedersen, 1997) of long-term sick leave. Sick leave also exists as a possible means of lengthening the time allotment of unemployment benefits. The following section gives a brief overview of the transition between each, rules of provision and respective generousities.



### **3. A Brief Characterisation of Welfare Benefits in Norway**

The welfare state aims to secure each individual in its society with a minimum standard of living and the National Insurance Act acts as the means of doing so. The National Insurance Act, as defined in Rettskildene (2002), amounts to an obligatory, national social insurance system. All individuals living in or employed in Norway have a mandatory membership. The social insurance element entails that individuals “contribute according to their ability and receive according to their need.” According to the National Insurance Act (§1-1), its main purpose surrounds the provision of economic security in various times of need resulting from unemployment, illness, family situations and age. Social, fiscal and work-related welfare provisions grant three main means of protecting the individual citizen against poverty and need.

The following benefits serve three main functions for those between 18 and 67 years of age: the covering of expenses, help to self-help and providing a basic subsistence. The financing occurs through membership fees, employer’s contributions and appropriations from the government. The size of the payments occurs according to the basic amount G generally used in social security calculations (per 2008 the average value  $G = 69,108$  NOK). Yearly changes compensate for inflation effects and possible wage growth. This allows for adjustments in the benefit amounts through G such that those heavily reliant on social security do not face shrinking real income.

#### **3.1 Present Scope and Generosity**

Sickness benefits provide full compensation of working income when illness causes a loss in earnings. The insurance covers the initial day of absence up to 50 weeks or 250 workdays –of which the employer covers the first sixteen. Individuals with chronic ailments can qualify for sickness benefits from the welfare system from the first day. The self employed receive only 65 percent of their working income unless

otherwise insured. The sickness benefits apply only to those earning a minimum of 0.5 G and has a maximum of 6 G. Employees may however have individual arrangements with their employers concerning full income under sickness even if it exceeds 6 G. In such cases the welfare system covers the first 6 G and the employer the remaining sum. In the case of a partial reduction in earning ability due to illness, one can apply for sickness benefits down to a level of 20 percent.

If this proves an insufficient time allotment for recovery one can then receive rehabilitation benefits based upon documented medical treatment with the intent of continued improvement of health conditions. The inability to return to previous employment and income earnings makes one applicable for these extended benefits for up to one year. These payments require illness as a clear cause and active ongoing treatment with the aim of recovery. Their subsequent size depends on the number of years with earned income and accumulated pension points.

An additional option under such circumstances concerns occupational rehabilitation benefits designed specifically for sustainability while undergoing occupational rehabilitation. Occupational rehabilitation consists of further education or other measures serving the intention of re-entering the work force or returning to former employment. One receives these benefits if undergoing necessary and appropriate treatments for illness, injury or handicaps with the intention of becoming or remaining employed. The amount here also depends on number of years with earned income and accumulated pension points.

Those who experience a long-term or permanent reduction of their ability to earn income due to sickness, injury or handicaps can apply for disability benefits –a provision for covering life's needs. One classifies such benefits as either temporary or a more permanent disability pension. In addition the benefits may include a basic or supplementary aid should there exist respectively, substantial extra costs or a need for particular attention.

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One receives short term disability benefits when the ability to work decreases by at least half and there exists a certain probability of return over the next one to four years. Those waiting for a classification granting permanent disability benefits can also apply. It amounts to a daily allowance five days a week for up to 260 days per year. The basis for the payments consists of the greatest of either 66 percent of pension giving income in the year before the reduction in earning ability or an average of this income over the previous last 3 years. This provides a minimum of 1.97 G and ignores pension-giving income over 6 G. Each child the individual provides for grants the possibility of an extra support of up to 0.4 G.

When improvements regarding the ability to work or earn income appear unlikely one receives a disability pension calculated in accordance with retirement pension payments. This includes both a base and an additional component. Those supporting a spouse and/or children become applicable for further benefits. There can still exist a possibility of coming back to work for shorter or longer periods without losing the right to these benefits. Work related injury benefits imply more favourable terms and possible compensation if resulting in long-lasting medical injury.

General unemployment insurance constitutes a partial reimbursement of lost income and a contribution towards helping in the search for work. The first three waiting days serve as the individual's co-payment. The base consists of the greater of two options –previous work income and eventual social security payments paid out in the last calendar year or the average earnings during the last 3 years before application. This amounts to 2.4 thousandths of the base or 62.4 percent of earlier income before tax. If one remains applicable for the benefits for over eight weeks during the calendar year then vacation money amounts to 8.5 percent of the gross money attained. A reduced level of unemployment benefits occurs when partially on sick leave, previously employed less than half-time or already accepting other social security payments.

## 3.2 The History of Sickness Insurance

Sickness insurance as it exists today took nearly 100 years to develop. The Norwegian Parliament agreed on the first law concerning publicly financed sickness insurance in 1909 and implemented it in 1911. The sickness insurance law became the first cash-assistance arrangement in Norwegian social political history. It guaranteed sickness benefits for those workers with the lowest wages and the right to free medical treatment. However, the law excluded the poorest and richest of the population and the self-employed. It took until 1956 for it to expand to a universal inclusion for all those over 16 years of age and the self-employed -although at a somewhat restricted level for the latter. Coverage gradually increased to 90 percent for some and sickness insurance evolved into a public good often quoted as ‘the gift the Norwegian people gave themselves and paid for themselves.’

After numerous adjustments, its inclusion in the National Insurance Act in 1971 also signaled obligatory membership for the self-employed. The maximum sickness benefit length was reduced from two years to one as that the Department at that time meant that those sick for one year had a right to move over to a higher benefit such as rehabilitation.

The controversial changes in the year 1978 consisted of the most momentous modifications in the rules surrounding sickness insurance still characterizing and providing the fundament of the present arrangement. The sickness benefit system became less restrictive, far more generous and encompassing. The responsibility of the payments during the first 14 days of sick leave fell to the employers. The increase to 16 days occurred later in 1998. One discarded the 3 day waiting period and the right to self-declared illness of up to six times per year entered. In addition, the benefits become taxable and gave the right to attain pension points. Much debate surrounded the choice of the compensation level. The end result of full compensation arose due to that many workers already received such after one or two waiting days. The payments faced a limit of 12G with the restriction that only a third of the income between 8 and 12 G entered the basis. The upper limit of 6G came later in 1985. The

law came in response to that fact that before 1978 there existed many forms of benefit arrangements for different sectors of the labor market. This led to pronounced differences between the groups –in direct contradiction to the desire for equality amongst the working population.

Since 1978 however the changes pertaining to sickness benefits have had a more restrictive role. In 1984, self-declared sick leave days fell to four and their calculation became based on calendar days rather than workdays. Further restrictive adjustments have occurred since. The most recent of which occurred in 2004 entailing the encouragement of doctors to prescribe partial sick leave and the extension to four income earning weeks required for compensated sick leave applicability.

Yet, the foundation set by 1978 reform resulted in three principles still in place today: the full compensation of income lost due to sick leave absences, equal opportunity for all employees of different sectors and the importance of public provision.

### 3.3 The Extent of Sick Leave

Sickness insurance provided according to the principles above covers a majority of Norway's total sick leave from the very first day. This total sick leave consists of two different elements –sick leave as approved by a doctor and the days personally declared. The latter has remained fairly constant over the years at 1.1 percent. Thus much of the focus often centers on the doctor-approved absence rates (NAV, 2009). As of 2008, this amounted to 6 percent. Of which women had a rate of 8.8 percent and men 5.5 percent. Though often claimed as high, Roger Bjørnstad (2007) argues for the need to see the rate of sick leave from a bigger perspective.

Rates alone reveal little when not in relation to something else –whether this refers to past rates or those for other countries. The possibility of a positive rate of sick leave as determined by a population's “natural rate” of sickness (Pedersen, 1997) presents an arguable minimum level. This lowest possible level depends on the general health



of the population, its composition and the structure of the labor market. An aging but actively participating population naturally requires a greater number of absences. A more inclusive workforce also leads to active employment of those individuals more apt to take sick leave. The organization of the labor market and its sectors effects the physical demands associated with different careers and the level of illness associated with them. All of these factors not only change over time but differ to some extent between countries. Norway has experienced a strong increase in labor participation and lies among the highest in the world with its high employment of both women and the elderly. This entails the entry of groups with high expected rates of sick leave into the labor market and may explain increases in sick leave even after controlling for economic developments. Further external influences include economic conditions, political decisions affecting employment and the interaction of sickness insurance with other welfare benefits. The very structural conditions of sickness insurance such as the degree of coverage, generosity and rules of sickness provision play an important role in not only determining the allowance of sick leave but its rate as well. The temporary effect of a change in the rules regarding the practice of doctors of reporting illness in 2004 may explain the drop in Norway's sick leave more than the introduction of the IA agreement as often assumed (Ose et al. 2006). The existence these highly variable factors emphasizes the importance of a historical perspective when assessing the rates of sick leave over time or between countries.

For the individual, a sickness occurrence depends on two main factors –their personal characteristics and the social and organizational framework of their surroundings. Separating the effects of these explanatory factors does not however neglect that there exists a mutual interaction between the two. The individual acts within a structural framework defining acceptable decisions based upon their social and physical conditions.

The very classification of health and ill-health defines the physical conditions classifying as acceptable reasons for sick leave. Health as defined by the World Health Organization (WHO) refers to “a person not only free from illness and

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weakness but enjoying complete physical, mental and social well-being.” The law concerning the right to sickness benefits specifically states that the inability to work must arise due to illness but without actually defining the term. Instead it refers to a dependence on the medical field’s definition and practice concerning the concept of illness. As stated in a report by NOU (1990), the Norwegian word “syk” has no singularly defined meaning but rather implies a state that satisfies criteria for some form of physical or psychological diagnosis differing from the normal. As such sickness includes both objective illnesses and subjective ailments (Ose et al, 2006). A doctor can easily diagnose the former but the latter often depends on a personal experience of pain difficult to measure scientifically.

The fluid definition of certifiable illness not only plays an important role in determining an individual’s state of ill-health and its extent amongst the population but can also evolve over time. It results in a sick leave rate not only dependent on the health of individuals but on variations in the classification of illness as well. In 1990, the NOU report found the possible medicalization of natural problems, conflicts or difficult life situations over time problematic. The likening of economical and social problems, as well as normal physical and mental reactions, to illness redefines acceptable reasons for sickness. This expands the definition of sickness to include other states of emotional or personal problems lacking direct consequences on health. It creates heightened need for sick leave without a basis in the actual worsening of health. Additionally, the general practitioners response to illness and certification practices influences the perception of ill health and its validity. Markussen et al (2009) finds that most “liberal” doctors approve nearly sixty percent more absence than the “strictest” doctors. The study finds further that the young utilize a sickness absence much more readily than the older generation. This represents a possible decline in the power of social norms in regulating the misuse of sick leave absences. If so, the forces of both gradual medicalization and the willingness to take unjustified sickness result in the greater use of absences than actually needed.

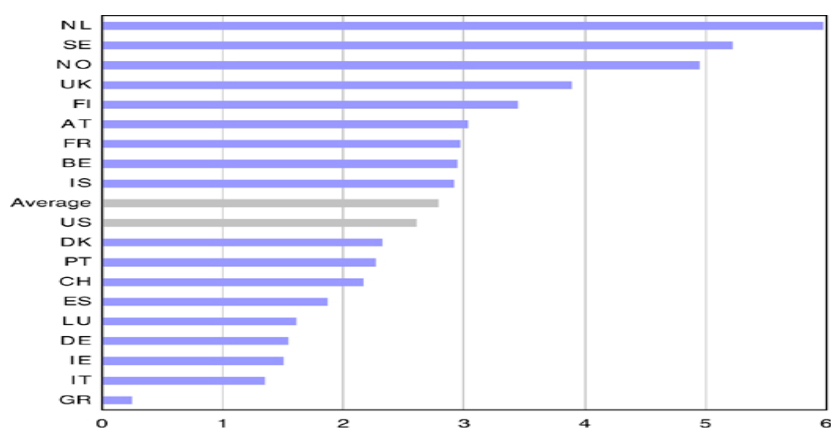
Two main health reasons lie behind much of the need for sick leave benefits – muscular-skeletal disorders and psychological dysfunctions. The former accounts for 45 percent of all sick leave benefit occurrences and the latter 17 percent (St.meld. nr. 9, 2006-2007). Muscular-skeletal disorders remain difficult to define or give a clear diagnosis but can give rise to many complications and health instability. For those over forty-five years of age muscle and skeletal problems lead to the most permanent disability while for those under forty-five physiological conditions amount to the most common reason. Psychological dysfunctions include everything from mild depression to anxiety conditions and serious psychoses. One of five doctor approved sickness absences states this as the reason for illness. There has occurred a market increase in psychological illnesses from 11.6 percent in 1995 to 17.6 percent in 2004. At the end of 2007 the occurrences increased from 13 to 13.7 percent and by one percent when considering men alone (NAV, 2009). Alcohol and drug problems remain little discussed as possible causes of sick leave, but as stated in the State Report nr.9 available information gives a clear indication that it has substantial influence on absences –especially among young people.

While personal characteristics such as age, gender and lifestyles all play an important role in determining an individual's health status, surroundings such as the work environment contribute greatly as well. Studies have found differences in absences and subsequent lengths according to industry and job conditions such as its organization, atmosphere, conflicts and other social aspects. The study "The Anatomy of Absenteeism" finds that sick leave in the "worst" workplaces amounts to almost 90 percent more than for the "best" workplaces (Markussen et al, 2009). This reveals that while "employee sorting" explains much of the variation in sick leave between workplaces, failing to attain a positive environment can also contribute to the illness of an otherwise healthy individual. As such, sickness can arise as a result of job related pressure or utilized as an alternative strategy in an effort to avoid such pressure. An individual not only can respond negatively to his own health but to the surroundings influencing that health as well.

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An economy's cyclical fluctuations may give rise to a procyclicality of sickness absence (Lusinyan and Bonato, 2007). Firstly, the labour market conditions can play a role in determining an individual's willingness to take a sick leave. Shapiro and Stiglitz (1984) consider the effect of unemployment as a "worker discipline device" making sick leave more costly in times of high unemployment. However, the major changes in Sweden's compensation rules tended to coincide with business-cycle developments such as the deep recession in 1991. The period of economic downturn characterized by high unemployment and a general deterioration of public finances led to cutbacks in many welfare programs –including sickness insurance. Secondly, Arai and Skogman Thoursie (2001) found a "selection effect" in that employers hire those with a tendency for sick leave during expansions but fire them during recessions. Countries with high unemployment protection however, such as Norway, lessen the relevance of this explanation.

Total sick leave in Norway has fluctuated greatly over time. It increased from around six percent in the late 1970's to almost eight percent the late 1980's. After which it decreased to below 4.5 percent in 1994. From then it again increased to over seven percent before falling to around six percent in 2004. Historically, Norway has a high level of sick leave relative to other countries. Figure 1 presents the average sickness absence as calculated over the years 1995-2003. It gives these rates as a percentage of employment for those between the ages of sixteen and sixty-nine. Their collection differs from that of the registered data making comparisons with the absence rates of Norway itself incompatible. As seen in Figure 1, Norway ranks third with an average rate of sickness absence of five percent. The graph presents a picture each country's relative standings but not without debated relevance. Such comparisons not only fail to capture differences in sickness insurance provisions but important determinants of sick leave in the country's economic, social, demographical and political spheres as well.

**Figure 1: Average Sickness Absence, 1995–2003 (As a percentage of employment)**

Source: Eurostat, New Cronos Database.

Notes:

AT=Austria; BE=Belgium; CH=Switzerland; DE=Germany; DK=Denmark; ES=Spain; FI=Finland; FR=France; GR=Greece; IE=Ireland; IS=Iceland; IT=Italy; LU=Luxembourg; NL=Netherlands; NO=Norway; PT=Portugal; SE=Sweden; UK=United Kingdom; US=United States.

### 3.4 The Costs of Sick Leave

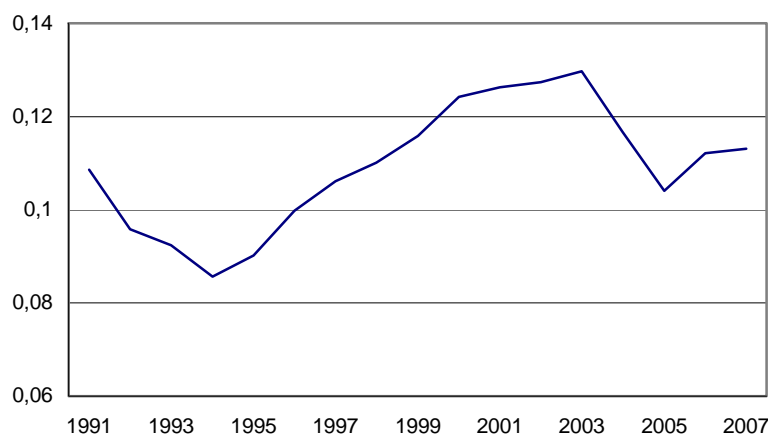
Regardless of its extent, sick leave costs – from welfare expenditures to production losses or missed career opportunities. The direct, positive relationship between sick leave and its costs arises through two channels – the number of occurrences and length of the absences. Norway with its sick leave rate of six percent and an average length of finished sick leave cases of 56.7 days (2005) alone implies large costs (St. Melding Nr.9, 2006-2007). But other indirect factors also affect the associated costs such as the employment levels, wage growth amongst the employed and necessary increases in the payment base G.

The employed have a natural need for sick leave and as such benefit expenses rise. The extent of the rise depends on the characteristics of the newly employed. Their wages and health status affect the compensation costs and degree of coverage needed. A successful inclusive work environment engages people previously on disability pension or excluded from the labor market due to health conditions. Individuals apt to have higher absence rates increase the benefit payouts but possibly lead to lesser expenditure elsewhere. Short periods of sick leave cost less than providing the same

individual with full disability pension. Furthermore, the individual's wages provide the basis of the income compensation. Thus the rise in costs also depends on the wages of those often utilizing sick days.

Sickness benefits have constituted a substantial portion of government welfare expenditure over time. In 2008, the proposed budget for sick leave payments included around 30 billion NOK in comparison to 28 billion NOK in 2007. Figure 2 presents SSB data on the government budget where sickness benefits accounted for 11.3 percent of government welfare payments in 2007. The associated costs naturally follow the conditions otherwise present in the economy. The fall in costs between the years of 1991 and 1994 resulted from a period of high unemployment in the economy. However, the main reason for the fall in 2004 benefits lies in the restrictive changes in the rules of provision and the encouragement of the doctors to use partial sick leave declarations. The year 2003 saw a high at 13 percent partially due to extensive labour market participation. It fell in the following year but has continued rising since. The average number of sick days covered by the welfare system follows a similar pattern. After increasing from nine days per man-labour year in 1994 to fourteen days in 2003 it fell to 11.4 in 2005 (St. Melding Nr.9, 2006-2007).

**Figure 2: Sickness Benefits as Percentage of Welfare Expenditures (1991-2007)**



Source: SSB

Furthermore, should the sick leave occurrence last longer than the allowed year the individual transfers to other health-related benefits. This compounds the cost of sick leave for the welfare system. Of those who start on sickness benefits, 86 percent return to the labour market. The majority return after a period of six months but twenty percent continue on welfare provisions for over one year. Most of those who utilize their entire year of sickness benefits move over to rehabilitation, occupational treatment or disability –respectively 50, 15 and 19 percent (St. Melding nr.9, 2006-2007). Yet another 16.5 percent moved over to a non-related type of welfare benefit. This means that 90.5 percent of those who max out their sickness benefits remain in the welfare system until eventually returning back to work.

While sick leave may not involve an immediate monetary loss for the individual, it still implies an income loss for the employer. Compared to the situation without sick leave, the firm either experiences a short run loss in production or increase in expenses. According to a SINTEF report carried out in 1999, the average cost of sick leave per day amounts to 1,700 NOK and a grand total of 14 billion NOK per year (Hem). Sick leave costs in terms of compensatory wages, indirect personal costs and extra expenses. The additional costs amount to as much as half of the wage expenditures (Hem, 1999). The firm loses income in the terms of lower production, higher costs associated with attaining replacements or overstaffing, delays, overtime, administrative necessities and possible loss in the quality of the product offered. Thus sick leave often costs more in the short run and more so for the industry than the service sector. Absences in the former directly affect production and the nature of the work makes it harder for co-workers to compensate.

### 3.5 Need for Reform?

The extensiveness of the development in sick leave and its subsequent costs remains an intertwined and problematic issue. It raises a number of economic, distributional and budget related difficulties. These present far from recent concerns however. A Norwegian Public Report from 1990 expressed great concern surrounding the

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developments and welfare costs associated with sickness absences. The estimated social economic costs in terms of production loss alone amount to almost 47 billion NOK per year (Hem, 1994). This has resulted in much discussion on how to lower sick leave with varying results. The Norwegian focus on an inclusive work force, as stated in the IA agreement, called for a reduction in total sick leave by twenty percent between the second quarters of 2001 and 2009. However, by 2008 it had only fallen by 1.7 percent. (SSB)

### **3.5.1 Lowering the Extent and Costs of Sick Leave**

The distinction between methods of reducing sick leave and its corresponding benefit costs lies in the difference between preventative action and modifying the rules of provision. The former includes medical preventatives, improved work environments and active assistance of the ill in returning to the labor market as a possible means of reducing the actual sick leave rate. The latter changes the rules of compensation and allows for lower costs under an existing level of sick leave. Much discussion centers on reducing costs through lower sick leave rather than comprehensive changes in the rules directly determining the extent of the costs.

In 1990, an NOU report concluded that revealing the costs to the employers of unsatisfactory workplaces would lead to the improvement of such factors within their control and thus lower sick leave. The NOU report in 1992 reached the same conclusion but with even more emphasis on the profitability for everybody of positive working conditions and the need for engaged employers. It concluded that the best economic incentive lay in giving the employers a greater economic responsibility for sick leave expenses. However, sick leave continued to increase and the results of a voluntary teamwork proved unsatisfactory. Come 1996, the Labor Department introduced a possible law for extending the coverage of sickness benefits by employers from two to three weeks. The suggestion hoped that such a change might greater motivate employers to constructively contribute to lowering sick leave and readily follow up the ill. It exempted however the chronically ill from the



employer's bill in order to avoid the marginalization of such workers. Again the focus centered on the benefit for all involved of a better workplace. Yet, things remained the same and the discussion continued. In 2001, the authorities and businesses signed the first agreement of an inclusive labor market (IA agreement). From 2005, it intends to use the human resources available in the economy and reduce sick leave –for the greater good of the individual, employer and society. It focuses on a present workforce, preventative action against sick leave and its reduction by 20 percent. As stated in a report carried out by SINTEF analyzing the economic consequences of sick leave, “lower sick leave benefits the individual, the firm and society” (Hem, 2000).

For the employer, a lower absentee rate or associated cost leads to lower unit costs and an improved competitive standing. A scarcity of labor further amplifies losses as short term replacements become harder to find and results in lower realization of possible market gains. The employer experiences a direct cost in terms of lost production which again affects the productivity of the society as a whole. As stated in the directive on the “Sources of Law” (2004), “only growth in production can carry the growth in welfare benefits.”

Modifying the rules of sickness insurance provision can include a number of possibilities. It can refer to a change in the approval practices of the doctors as in 2004. Or it can refer to direct changes in the laws of provision. The characteristics often differing between countries pertain to the qualification period, the number of waiting days, the degree of compensation, the maximum days covered and the portion financed by the employer. The Norwegian provision of full compensation from the very first day amounts to the most generous by far. A waiting period transfers some of the cost of illness to the individual directly and removes the shortest of the sick leaves from the employer's funding bill. Restricting the rights to the benefits lessens the burden of sick leave compensation but implies a faster movement to other and possibly more costly transfers. Extending the cost of the employers shifts costs from the government to the firm but the absolute level remains the same

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neglecting possible behaviour changes on the part of the firm. Reduced compensation on the other hand lowers costs directly and immediately. Such short run savings may lead to long run loss if the alterations lead to longer periods of illness and more disability later on. But this also reveals the two-part effect of reduced compensation. It both directly lowers costs and influences sick leave behavior. In 2007, the OECD recommended that Norway with its high rate of sick leave reduce compensation in order to weaken the generosity's incentive effect on work effort.

### **3.5.2 The Pros and Cons of Reduced Compensation**

As a viable means of both reducing the costs and affecting the rate of sick leave, reduced compensation receives little attention. Many of the suggestions above only briefly mention a consideration of reducing the generosity of sick leave. The nature of its provision may explain its standing. The public provision of sickness insurance ensures that the economical consequences of illness do not constrict the lives of those experiencing periods of sickness. It acts as a means of redistributing income between time periods and people with the intent of attaining greater equality. The extent of which depends on the degree of generosity. A collective, encompassing and centralized welfare system only constitutes one of the fundamental roles of a welfare state. Nevertheless, welfare benefits, such as sickness insurance, amount to the most important economically (Rettskildene, 2004). In the case of universal applicability and complete coverage, the government redistributes income over the life of an individual's health cycles and between individuals of differing health conditions. Full compensation arises in response to the welfare state's intent of creating equal opportunity for all independent of both background and economic status.

One of the central arguments against a reduction in the compensation level concerns its possible distribution effects. (Ose et al. 2006) There exists a continuous increase in health-related problems amongst those with less education and lower incomes who represent a majority of those receiving health-related benefits (St. Meld. Nr 9, 2006-

2007). This implies that those with the lowest wages and poor health face a greater impact than others. Reduced compensation hits those with the most sick leave hardest and as seen statistically set this consists of laborers and low paid employees. Those with especially physically demanding careers and a difficult work environment might also feel the consequences of such a reduction more so than others. The concentration of the effects of reduced compensation to a portion of the labor market could imply a “step back rather than forwards” for equality. Lower compensation reduces costs but affects those using the benefit the most. Should this consist of the weak in terms of resources and health then those most unable to bear the losses experience the relatively greater economic impact. Moreover, those with the resources and health to withstand such a change present minimal savings if they do not utilize the benefits substantially. Reducing the level of compensation will reduce the income of the ill while they at the same time experience possible increased health related expenses such as doctor fees and medicinal needs. In the presence of a progressive tax system however the reduction in disposable income amounts to less than the lost income before tax.

Allowing for greater economic equality over an individual’s life span and amongst the population can further affect the very utilization of sickness insurance. Social status as determined economically or historically can play a role in an individual’s health as gives rise to the connection often referred to as a “social gradient in health” (Marmot, 2005). Social determinants such as education, family background, career choices and income influence the degree of illness and constitute an observed connection between social status and well-being. Markussen et al (2009) find that this gradient remains for all such factors and a link between high social status and low absence rates. From the income perspective Norway, with an all inclusive health system and high level of benefits, grants those with higher incomes little opportunity to purchase better health care. The effect of the “absolute income” hypothesis may appear weaker than the “relative income” hypothesis (Theodossiouu and Zangelidis, 2006). In the latter relative economic status affects an individual’s state of health. A well-off individual with high income has greater opportunity to buy healthier food,

exercise, control the everyday and participate in society than someone of a less fortunate standing. The possible resulting extra stress, lowered self-esteem can lead to what Marmot referred to as a “status syndrome” (2004). The main means of counteracting this effect include both social support and full participation in society. Thus a goal of a more inclusive work place as exemplified in the IA agreement would seemingly contribute to a lessening of this negative health impact through lower degrees of social exclusion and increased opportunities of social participation. This in turn provides possibilities for improved mental and physical health of the now included and perhaps a weakening of the connection between an individuals overall well-being and earnings. The above connections support the link between economic and health equality.

On the other hand, sickness insurance as a public good may lead to a population that considers themselves more ill or worse off than before even without any changes in actual health. This contradicts the very goals of betterment that it stands for. As the line between healthy and ill diminishes in clarity the pressure on the healthy increases for maintaining society’s production and thus an increased risk that these also start to fall ill. SSB finds in its surveys on health and living circumstances that the personal evaluations of health amongst the population of Norway change little over time. However, the report (NOU, 1990) arrives at the conclusion that the development in the use of sickness benefits may actually lead to further inequality rather than equality.

With a high degree of compensatory wage, an increased need for benefits then restricts the welfare states ability to achieve other important social political goals. In the long run, a conflict develops between the generosity of sickness insurance and other redistribution goals. Lower costs in regards to sick leave payments can provide a possible economic means of solving the redistribution problem in both the short and long run. In the short run with given budgets made on a yearly basis, large payments require cuts in funding to other budget posts. Such necessary saving measures may lead to a greater negative impact on other forms of redistribution. If alternatively, the

rising costs are financed through higher taxes then further real economic consequences may result.

Furthermore, in a country with a high degree of employment protection, a reduction in sickness insurance would appear to condone to a greater incentive to hire those with health problems. It may improve the attainability of an inclusive labour force as the costs associated with those frequently absent declines. The OECD voiced concern that full compensation might actually lead to an excluding work environment instead (SSB 2007). Regarding equality considerations this might actually constitute an argument for reducing compensation without the otherwise inherent conflict between achieving equality and economic policy goals.

When considering insurance the first best solution includes of course full compensation regardless of any other considerations or welfare goals but this also assumes perfect information. In a world of imperfect information, complete insurance for all arises only with government regulation and with it the behavioral and social consequences of such generosity. The trade-off between redistribution in the name of equality and the influence of such provisions on individual's actions shapes the formation of countless political decisions related to social welfare. The relationship between the role of generous sickness benefits in redistributing income and its impact on incentives provides the basis for much of the current social political debate. As such, this study examines the redistributive aspect in an attempt to quantify the importance of sickness insurance for economic equality.

## 4. Methods and Data

### 4.1 Methods

This paper aims to evaluate the importance of sickness benefits for economic inequality. In order to do so I compare actual to fictional earning streams resulting from a reduction in the sickness replacement rate. This constitutes a fall in sickness compensation from full to eighty and zero percent of working income. Following a sample of individuals over a period of thirteen years allows for the collection of information concerning their income and welfare benefits. Each income flow enters as a means of capturing both the personal monetary consequences and its impact on the population's income distribution. In the presence of sick leave, an individual's income depends directly on the generosity of sickness insurance –creating a new set of income distributions for each level of compensation. However, this process neglects the possible behavior effects of reduced generosity. The incentive to work increases as the cost of illness rises for the individual. The possible fall in sick leave would lead to even lesser income differences between the individuals of the population. Thus, calculating the income changes under the assumption that behavior remains the same in both cases creates a ceiling value for the resulting differences. Measuring the inequality over the new distributions of total income reveals the economic impact of lessened benefits.

A simple equation represents the connection between earnings and sickness benefits within a year:

$$y(b,n) = w(1-n) + bwn + z$$

where  $y$  equals total income,  $w$  working income,  $b$  the benefit level,  $n$  the rate of sick leave and  $z$  other monetary gains. An individual's income contains two parts separable from the benefit component. These remain constant regardless of compensation changes. Calculating the portion of each individual's income

independent of benefits becomes a simple matter of merely subtracting the benefit amount from total income. The data provides the amount of sickness benefits received by each individual over each absence period and their yearly incomes. Dividing benefits by the number of absences due to illness gives the daily benefit payments serving as an indicator of working income. It may represent a full or fraction of daily working income given the existence of various coverage levels within each regime. The income earned per working day serves as the basis for all future benefit calculations. New benefit payments involve lower replacement percentages for the same daily income and number of days absent. Implementing a new compensation level reduces all greater levels to the new. The total income for that year now equals the sum of the income exclusive of original sick leave payments and the fictional replacements. As that the primary interest concerns the development in total income for all thirteen years one sums the yearly totals in each case. Given the change in price levels over time however, all the monetary values are inflation adjusted to 2008 prices. This gives each individual one income variable changing under each level of generosity and the resulting income distributions for the population. As compensation falls, measuring the changes in the income distribution indicates the impact this has on economic inequality.

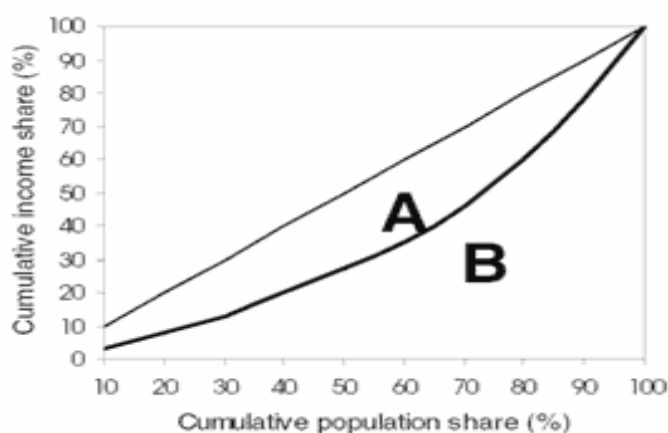
#### **4.1.1 Measurements of Inequality**

In order to explore the degree of economic inequality there exist a number of possible measurements differing in complexity. These range from the commonly used Gini index to simpler income ratios between population percentiles. Regardless of the inequality measurement used however the following five requirements apply as proposed by Anthony Atkinson in 1970. Firstly, the importance of anonymity in ensuring a focus on the income distribution independent of to whom the income belongs. Secondly, independence of scale such that the measurement captures differences in actual income not income levels. This allows for comparisons between countries with different standards of living. Thirdly, the need for population independence such that equality differences between countries of different sizes

cannot be attributed to mere population differences. Fourthly, the transfer principle, which states that income transfers from the rich to the poor not changing the ranking order, should not increase inequality. Lastly, with normalization the value of inequality should be zero with complete equality and greater than zero the moment incomes differ. The Gini coefficient as a measurement of inequality satisfies all of the above.

The Gini coefficient ( $G$ ), a statistical dispersion measurement, lies within a range between 0 and 1 (0% and 100%) –where 0 indicates perfect equality and 1 maximum inequality. The income boundaries used in the sample ensure that no individual has a negative income as that the Gini coefficient then becomes inapplicable. While the Gini lies between 0.25 and 0.50 for most developed countries, it can rise to a high of 0.707 for Namibia in 1993 (World Bank, 2004). It measures the share of the population to the income share –graphically represented in Figure 3 by the area between the Lorenz curve and the line of equality. The Lorenz curve maps the observed cumulative income share on the vertical axis and the distribution of the population on the horizontal axis. The coefficient results as the area A divided by the sum of both areas A and B in Figure. When all individuals hold the same income then the line of equality falls along the 45 degree line.

**Figure 3: Gini Coefficient and the Lorenz Curve of Income Distribution**



Source: Wikipedia (2009)



Agnus Deaton, a Princeton development economist, created the simplified version of the Gini calculation used in this paper:

$$G = \frac{N+1}{N-1} - \frac{2}{N(N-1)u} \left( \sum_{i=1}^n P_i X_i \right)$$

where  $N$  reflects the number of individuals in the population,  $u$  their mean income, and  $P_i$  the income rank of person  $i$  with income  $X_i$ .

In order to calculate the Gini coefficient one needs to know the mean income of the distribution, the number of people, and the income of each person. Sorting the sample in descending order according to income places highest incomes first and the lowest incomes last. This grants the economically disadvantaged a greater weight in the income distribution and the well off less so in their respective ranks of one and  $N$ . The Gini index however reveals nothing about where changes in the underlying income distribution occur, just that they do.

Income ratios measure the total income between corresponding percentages of the population. They depict movements in the total income of the different groups lacking in an aggregate measure of inequality. The classic divisions between lower, middle and upper income divisions arise –covering the entire income spectrum. When compensation falls, they capture the relative extent total income decreases at each percentile. Simple, straightforward ratios such as 90/10 or 75/25 give an easily comprehensible insight into changes in the income levels between the top and bottom rungs of the economic ladder.

Together, these inequality measurements describe the development between income classes, within income classes and their significance. They portray the extent to which reductions in sick leave compensation matter economically and not only how the income distributions change but where.

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## 4.2 Data

Register data collected by Statistics Norway contains information on income, employment, welfare benefits and the time spans the payments cover for all those living in Norway during the years 1993 to 2005. In this study, the main variables of interest for each anonymous individual and year include total income, sick leave and sickness benefits.

Reduced compensation directly affects the incomes of those with sick leave and the right to benefits. Analyzing the inequality of income distributions before and after such a change then requires a population for whom such comparisons are meaningful. The composition of the population not only affects the existing degree of inequality but its development over time. Norway's population as a whole contains both young and old, students and retirees, men and women -each with their respective income and health characteristics. Not only does income differ between men and women but the rate of sick leave as well (Ose et al, 2006). In addition, sickness payments include pregnancy benefits in some of the earlier data (prior to 1999). As a result, I choose to follow a sample containing only men.

Generally speaking the young have better health, study, work-part time, and have little use for sick leave. Employment not only falls amongst the older generation but as they age those still working experience a possible heightened need for sickness benefits until they retire. As a result, I include all middle-aged men thirty years old in 1993 and still alive in 2005.

The selective criteria based on both age and gender provide a common base for the portion of sick leave dependent on such factors and a more uniform composition of individuals. The rate of sick leave still differs between individuals but according to personal characteristics and response to a mutual state instead. The arising changes in inequality then reflect the importance of income changes rather than capturing a mixture of economic stages dependent on life and health cycles.

The resulting population of men contains 31,613 individuals irrespective of employment or health status. Yet, each individual's labor history follows a movement through various stages and forms of employment, sick leave, rehabilitation, short-term disability, long-term disability or unemployment. As a result, in any given year it also consists of those unaffected by changes in the sickness compensation level. Those applicable for sickness benefits and directly affected by its changes include only the employed and those on unemployment benefits.

An interesting sub-selection of the population consists of those employed throughout the entire time period 1993-2005 (i.e. all thirteen years). For these 15,718 individuals the degree of sick leave compensation has the potential to directly affect their income. With a constant labor supply apart from sick leave, they represent the workers for whom sickness insurance exists. The impact on the distribution of these incomes reflects to what extent sick leave compensation matters for those it potentially affects the most. Measuring the changes in inequality amongst the broader population on the hand reveals the importance of sickness benefits for the selection in its entirety.

Sickness benefits as given in the data refer to absences covered by the national insurance plan. This generally entails sick leave from the sixteenth day of up to 6 G. In some cases it covers individuals with a particular need for sick leave from the first day. It also excludes benefits greater than 6 G sometimes covered by the employer voluntarily. I also include the welfare state's sickness payments to fishermen, fishermen on berth, the self-employed, farmers and foresters as they represent possible occupations of the men in the sample population. The broadening of the sickness benefits included captures a greater portion of the sickness compensation payments received by the study's population.

In this paper, an individual's sick leave equals the number of days receiving sickness benefits from the welfare system. This underestimates the actual number of sick leave as that it excludes the days personally declared or employer financed. Given a requirement for doctor-approval earlier on in the sick leave case, data on certified

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absences provide an alternative and more accurate measure of actual sick leave. However, such data did not arrive until the year 2000. Sick leave on a yearly basis refers to the sum of all incidents within that year and cases running over several years divide the days accordingly. The dataset also gives the compensation associated with each absence. Not all recipients receive 100 percent compensation due to reasons such as self-employment, partial sick leave, and varying employment. For those individuals with several different compensation percentages within the same year, I use an average of their compensation levels instead.

The number of days employed for each individual is important for determining the degree of employment, calculating the rate of sick leave and selecting the sub-population. The days as recorded by the employer present a slight difficulty in that it differs from the stated working days. To compensate I use the greater of the two with a cut-off at 365 days. Occasionally, the number of days on sick leave exceeds the days employed and in such cases I set the latter equal to the former.

The yearly pre-tax total income includes all wage income, capital income, taxable and non-taxable welfare benefits received during the calendar year. The incomes as given in the dataset register both excessive gains and losses uncommon for most individuals. In order to avoid the effect of these outliers on the results, I restrict incomes to lie within zero and five million NOK. Additionally, the data provides both pre- and after-tax incomes. After-tax income depends upon both the generosity and changes in the tax system. Given the time span considered, taxes change along with the party in power and other political goals. Norway's focus on equality of opportunity places further emphasis on the redistributive role of taxes. This results in lower inequality both before and after compensation changes when using after-tax income. With taxable sickness benefits, the reductions in the degree of compensation lessen the tax bill of the individual –dampening the effect of lost income. Pre-tax income then provides a ceiling value for the inequality resulting from an income change due to decreased generosity. I choose pre-tax income for simplicity and to avoid the re-distributive role of taxes.

The data provides the necessary variables for conducting the analysis on the two groups –the entire population and the employed population. Each population consists of individuals differing in everything from income to sick leave. However, given the extra requirement of thirteen years of employment for the latter population, their compositions naturally differ. Thus I begin by describing the developments and characteristics of each group with the original compensation levels still in tact. This provides a basis for comparison when reducing the benefits later in the analysis. Total income constitutes the main variable of interest for determining the degree of inequality and the importance of sick leave benefits. The size of this sickness compensation depends on an individual's wages and rate of sick leave. The growth in average income provides an idea of the growth occurring in compensatory payments. The utilization of sick leave over time reveals to what extent these payments are required. I then look at how much these benefits cost the welfare state. The social insurance system offers provisions in states of unemployment, rehabilitation and disability in addition to sickness benefits. The benefits differ in generosity, length and rules of applicability. The interaction of these benefits also plays a role in determining the use and importance of sick leave compensation.

#### **4.2.1 The Distribution of Income**

The total income for each individual represents the sum of the yearly incomes between 1993 and 2005. The spread of this income among the individuals determines the degree of inequality present within the population. Ranking the individuals of each population according to their total income and finding the income at each percentile gives an idea of to what extent the incomes vary. The percentiles refer the proportion of the population with an income up to the stated amount. Table 1 depicts the results. It also includes the average income needed per year to accumulate the stated total income. This provides an idea of what such large sums signify. For the highest earning individual of the entire population to end up with a total of about 63 million NOK he would have to earn an average of 4.8 million per year and so forth. The median income amounts to a total of 5.7 million or an average

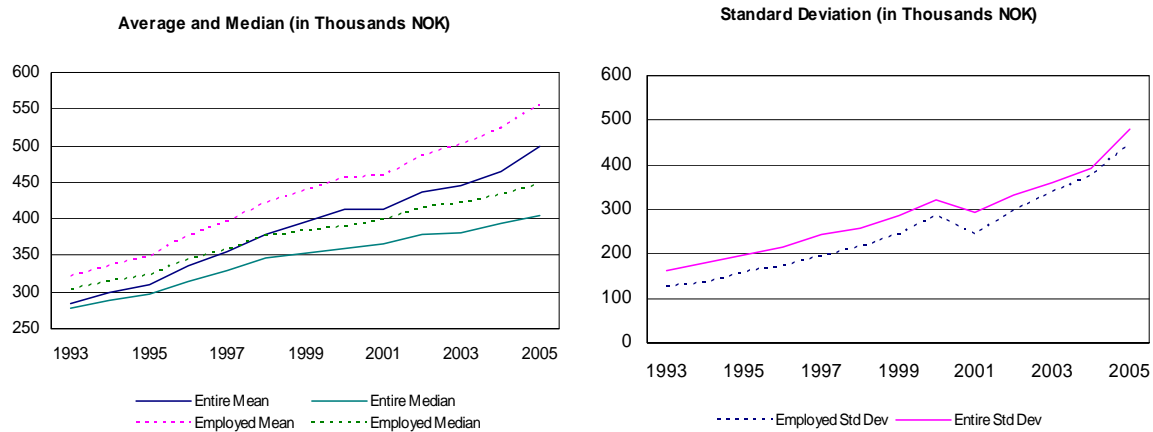
of 350,000 NOK per year. The employed population has a more compact distribution of income as illustrated in the table. Their income distribution contains both higher and less stratified total incomes –hardly surprising given that each individual works all thirteen years.

Percentiles	<i>Entire Sample</i>		<i>Employed Sample</i>	
	Total Income	Avg. Total Income	Total Income	Avg. Total Income
100	63 049 454	4 849 958	52 846 161	4 065 089
99	15 877 620	1 221 355	15 591 761	1 199 366
95	9 366 123	720 471	9 779 834	752 295
90	7 652 353	588 643	8 138 998	626 077
75	5 735 404	441 185	6 185 674	475 821
50	4 511 740	347 057	4 939 170	379 936
25	3 622 175	278 629	4 217 535	324 426
10	2 556 479	196 652	3 719 383	286 106
5	2 002 488	154 038	3 465 327	266 564
1	1 127 044	86 696	2 970 193	228 476
0	0	0	668 724	51 440

Given the importance of the yearly value in determining the total income, Figure 4 portrays the development in average and median incomes for both groups. The median income lies under the average and registers less change in economic downturns, such as that occurring with bursting of the dot-com bubble in 2001. For the entire population, average yearly income rises steadily –from around 285,000 to 500,000 NOK. This implies an impressive wage growth of 75 percent as one follows the men through the start and further development of their careers. For those employed all thirteen years, average yearly income follows a similar but higher path – from 320,000 to 550,000 NOK. Average and median incomes start close and eventually widen for both populations as wages increase greatly for some individuals but not all. The individuals with the highest earnings influence the median income much less than the average income. The median income measures the value for the individual in the middle of the income ranking. Thus only the number people with high earnings matter rather than the actual monetary values. Not only do incomes increase as the men age but the differences between their incomes too –as reflected in the rising standard deviations. Overall, the income developments reflect the

transition over the years of newly graduated, less experienced men into different career paths, pay and opportunities. These rising economic differences on a yearly basis then underlie the distribution of total income amongst the population.

**Figure 4: Yearly Incomes for Entire and Employed Population (1993-2005)**

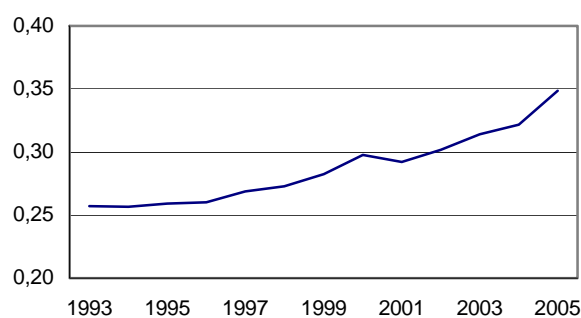


## 4.2.2 The Degree of Income Inequality

Even with full compensation, total income is far from evenly distributed. The changes in income inequality seen relative to that already existing reveal the extent to which reduced compensation matters. The Gini coefficient for the total income distribution of the entire population comes to 0.2535 –typical of Scandinavian countries and slightly lower than Norway’s overall value of 0.258 as measured in 2000 (World Bank, 2004). The substantially lower Gini for the employed of 0.1917 reflects its composition of individuals similar in both constant employment and incomes.

Figure 5 shows the development in the Gini for the entire population over the years 1993-2005. The Gini coefficient rises steadily from 0.25 to 0.35 and follows a path quite similar to that of the standard deviation in total incomes. The ten percent increase reflects an aging population that differs more so over the years and less so in economic slowdowns such as that occurring in 2001.

**Figure 5: Development in the Gini Coefficient for Inequality (1993-2005)**



The Gini provides an overall idea of the degree of inequality but does not reveal where in the population this inequality exists. Total income clearly differs between different sections of the population but not to the same extent. Constructing ratios between the incomes of chosen percentiles gives the income of the one in relation to the other.

The ratio for individuals at the bottom and top ten percent of the population (90/10) embodies the classic comparison between the top and bottom rungs of the economic ladder. On average, the ninetieth percentile earns around 590,000 NOK per year while the tenth has an income of around 195,000. This amounts to earnings three times greater. The income ratio between the top ten percent and the median income (90/50) relays the extent the difference between the well off and bottom half of the population widen. The median total income implies an average of 350,000 NOK per year. Half of the population have an income at least 1.7 times less than the top ten percent. The income relationship between the median income and the bottom ten percent of the population (50/10) describes the degree to which the relatively poor get left behind by the upper half. This produces a similar ratio of 1.8 implying a nearly equal distance in earnings between the top and middle portions of the population as the middle and lower income individuals. The relative incomes of the employed selection vary less. The ninetieth percentile only earns 2.2 times as much as the tenth. They also earn 1.6 times as much as the median income. The ratio between the median income and the bottom tenth amounts to a lower value of 1.3. This



reveals greater economic similarity amongst the bottom half of the population due the common trait of employment in all the years of the sample.

A number of factors account for the wide range of total incomes. The main interest of this paper concerns the connection to and the importance of sick leave payments. The average yearly incomes of the population clearly increase. This implies an increase in the size of the benefit payments received when sick. The utilization of these larger sick leave benefits further depends on the level of sick leave present.

### **4.2.3 The Extent of Sick Leave**

Sick leave in both the entire and fully employed population develops quite similarly over the years 1993 to 2005, but at markedly different levels and rates of increase. Figure 6 presents the yearly rate for the entire population, the employed. In addition, it presents the rates relative to 1993 and Norway.

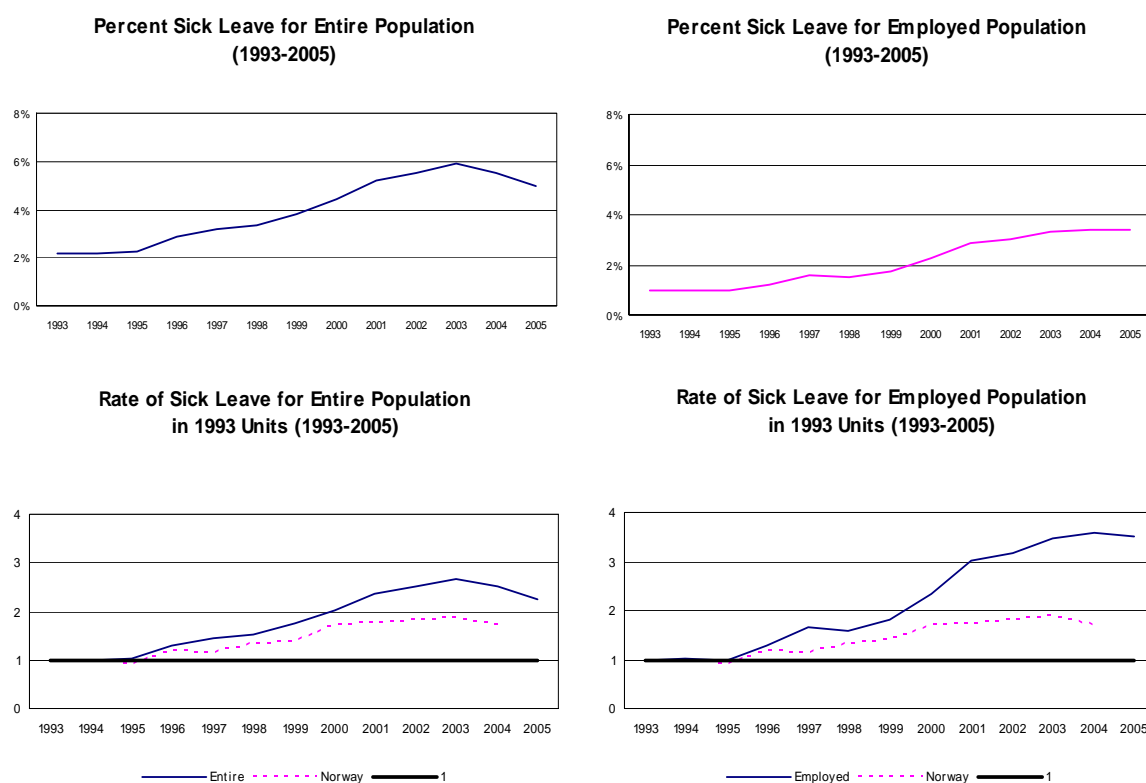
Sick leave clearly rises over the years for the men considered here. Both rates start out low and increase fairly steadily until 2004. For the entire population, sick leave starts out at a rate of 2 percent and reaches a maximum of around 6 percent in 2003. Sick leave for the employed follows the same pattern but starts at 1 percent and reaches a high of 3.5 percent. The respective rates end at five and three percent. Following changes in sick leave regulation in 2004 however, the responses change. The absences of working population decline while those belonging to the 13-year employment group merely taper out. Restrictions in the rules for sick leave appear to have a greater negative impact on the general workers absence rates. This implies that the steadily employed with already low absence rates respond less than those flowing in and out of the labour market.

Standardizing the initial year to one allows for the inclusion of Norway's sick leave rate as a descriptive factor. Including the rate of sick leave for Norway explains to which extent the increases reflect that of the general population rather than a unique development for the sample's individuals. The resulting unexplained difference

between the two rates then arise due to other factors such as aging or the acquisition of more demanding jobs as work experience increases.

Sick leave for the entire population closely follows that of Norway's population. However, the gap between the two widens over time. While those employed for all 13 years have a lower absolute level of sick leave, in 2005 the rate rises to 3.5 times greater than in 1993 and far exceeds that explained by the Norway's general level of sick leave.

**Figure 6: Rate of Sick Leave for Entire and Employed Population**



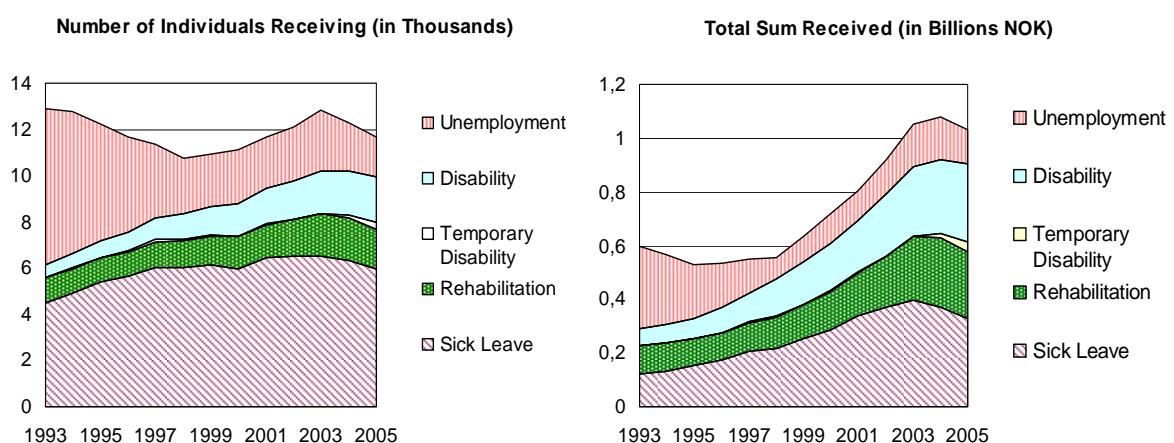
#### 4.2.4 Sick Leave Benefits in Comparison to other Welfare Benefits

Each individual can experience various states of employment and health during the time period. As such, sick leave insurance does not play a singular role in providing for the individual in times of need. The welfare state offers other numerous benefits to support an individual through various stages of life and health. The size and scope of sickness benefits in comparison to other welfare provisions relays their relative use

by the population and monetary value. A reduction in a benefit both important for many and large in size affects both a greater number of people and their incomes. Figure 7 presents the number of individuals within the entire selection receiving welfare benefits in the case of sickness, rehabilitation, temporary disability, disability or unemployment. The developments over the time period reflect the extent to which the use of each changes. Note that any individual can utilize a number of benefits within the same year. In the beginning of the study, around 6,700 individuals in the entire sample receive unemployment benefits. This declines over time however as the men most likely find steadier employment. Overall, sickness benefits appear as the provision most used –growing from 4,500 to 6,000 individuals within the period. Rehabilitation and disability benefits also increase. These developments indicate an aging population of men moving into more permanent jobs and decided careers. It reflects a process of acquiring a full-time job with the occasional need for sick leave and the possibility of long-term illness further hindering the ability to work.

The sum of these payments also increases steadily over the years as expected with increased recipients. Sickness benefits constitute the largest benefit sum within the time span considered.

**Figure 7: Number of Individuals Receiving Each Benefits and the Sum (1993-2005)**



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#### 4.2.5 Government Expenditures on Sick Leave Benefits

Sickness benefits clearly constitute a large portion of welfare expenditures. The sick leave days registered here only consist of those covered by the social insurance program. Thus the sum of the benefits to the individuals represents the cost to welfare state. For the entire population, the average cost per day of sick leave amounted to 650 NOK in 1993 but has fluctuated around 750 NOK since 1996. A rise in 2001 led to the 2005 average cost per sick individual of 775 NOK. In percentage of Norway's GDP, the total cost of sickness benefits for the individuals within this sample increased from around 0.025 percent to 0.05 percent from 1993 to 2005. This percentage appears small but for 2005 it amounts to 300 million NOK. The individuals covered in this calculation only represent one percent of Norway's entire working population. For Norway as whole, the cost associated with sickness benefit payments amounts to an even more substantial 2.4 percent of GDP (Markussen et al, 2009).

Figure 8 graphs the growth of the government's expenditures on sick leave for the entire population relative to 1993. The size of these expenditures directly depends on the rate of sick leave, the wages of those receiving the benefits and the number of labourers with the right and need for such compensation. In order to see how much each factor accounts for the growth in expenses, I also include the growth in the population's incomes, sick leave and employment relative to 1993. The benefits paid rise in a pattern very similar to that of sick leave as expected but do not completely account for the increase in costs. The degree of employment relative to 1993 changes little over the time period and does not contribute. However, average incomes have risen steadily over the years and when included with sick leave the two explain nearly the entire expenditure pattern. Fully replacing the rising incomes of an increasingly ill population thus explains much of the rising costs faced by the welfare system.

**Figure 8: Growth in Expenditure on Sickness Benefits and Other Relevant Factors (Relative to 1993)**



Sick leave payments as a benefit for the individual present a direct loss for society in terms of expenditures and lower productivity. The welfare state willingly bears these losses for the sake of advocating income equality. The population descriptives reveal that of those considered, sickness benefits both constitute the most commonly received benefit and a large income transfer. Yet perhaps the reduction of these costs need not necessarily come at the sake of equality. Reducing the compensation both lowers the cost of each episode and possibly their number. The evaluation of such a policy change constitutes the main focus of the following analysis.

## 5. Empirical Analysis

Implementing less generous benefit regimes both reduces the accumulated income of the individual and the direct cost to society of sick leave. The individual loss equals the reduction in total income over a span of thirteen years. I now look at how much this loss actually entails in lost income.

For the entire population, eighty percent compensation results in a total income loss per individual level ranging from nothing to 285,000 NOK. Without any sickness benefits the maximum occurs at 1.5 million NOK. Each compensation level amounts to a respective 0.3 and 1.95 percent loss in total income. The total loss for the fully employed amounts to slightly less at 0.23 and 1.36 percent. The change in the standard deviation of these incomes reveals a minute increase in their spread.

On a yearly basis, the average incomes and standard deviations also show little change. With a compensation of eighty percent average incomes fall at most by 0.43 percent or 1,913 NOK in 2003. The average incomes in the beginning of the study show the least loss at 0.20 percent or 600 NOK. With no benefits at all, 2003 again marks the highest loss by 2.62 percent or around 11,600 NOK. As expected, the pattern in the average yearly income loss follows the rate of sick leave fairly close.

The change in total income reveals relatively little loss for each of the populations. Yet for changes in equality, it is not the absolute size of the loss that matters but its distribution among the individuals.

### 5.1 Effects on Economic Inequality

Economic inequality as evaluated here refers to the degree of income disparity between individuals. Overall, Norway has a low rate of economic inequality in comparison to many other countries of the world. The World Bank compilation of Gini coefficients from around the world (2004) places Norway seventh with a value

of 0.258. The Gini coefficient for the entire population in the sample represents this closely at 0.2538. The employed population however has an even lesser degree at 0.1917. As seen, both sample populations exhibit relatively low income disparities before any changes in compensation occur –in accordance with the stated aims of the welfare state. The following analysis examines to what extent this economic inequality increases as compensation falls.

Changes in inequality measurements such as the Gini coefficient capture to what extent lower compensation reduces each individual's income stream in relation to the others. Should the loss have a greater impact on particular individuals more than others, its value would increase. Additionally, it places a greater weight on the economic situations of those least well off. Should the impacted individual lie in the lower ends of the income scale then the Gini would increase more than for an individual with high income. The Gini coefficient measures the importance of the resulting income changes for inequality.

Table 2 portrays the developments in the Gini for each level of compensation and population. The percentage point change refers to the increase in the Gini when compensation falls to eighty and zero percent. With eighty percent compensation the Gini increases by 0.12 percentage points for the population as a whole and 0.6 for the employed –to respectively 0.2547 and 0.1977. Without any compensation the Gini increases by respectively 0.83 and 1.06 percentage points to the final values of 0.2618 and 0.2023. Had a rise in the Gini to 0.2618 represented the entire country, it would not have displaced Norway from its standing in inequality rankings. The Gini on a world-wide basis covers a wide spectrum of values including Denmark at 0.247 and the United States 0.408. An increase of 0.83 appears quite small in comparison to the wide differences already existing amongst countries –a 1.06 change somewhat more important. Inequality rises in both cases, but more so for the employed. Those in constant employment may lose less in absolute income but equity falls more than for the general population. This reflects the direct connection between the employed and the use of sickness benefits. With full compensation, the employed have a more

evenly distributed income. But given the concentration of high sick leave to relatively few, the reduced benefits widen the income gap between the often ill and the healthy.

**Table 2. Gini Coefficient According to Compensation Level**

Compensation	<i>Entire Population</i>		<i>Employed Population</i>	
	Gini Coefficient	%Pt. Change	Gini Coefficient	%Pt. Change
100	0.2535	0.00	0.1917	0.00
80	0.2547	0.12	0.1977	0.60
0	0.2618	0.83	0.2023	1.06

## 5.2 Who loses and how much?

While the loss of benefits does not greatly affect inequality, its increase indicates an impact on someone, somewhere in the income distribution. The question then becomes who bears the income losses, their size and the importance relative to total income.

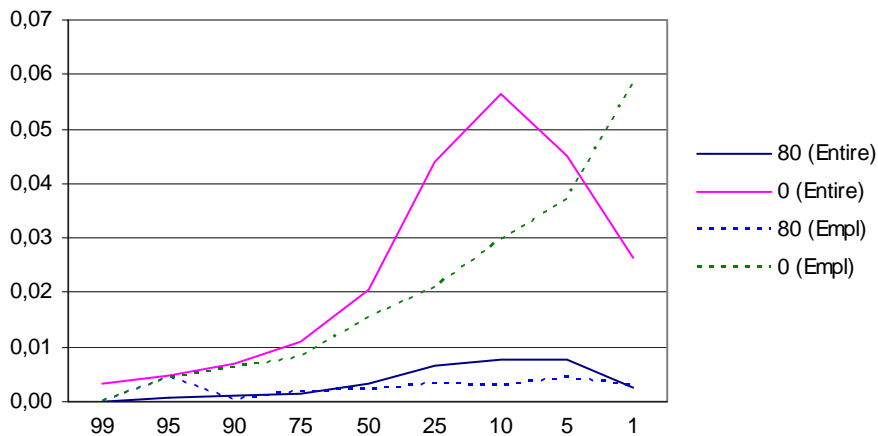
Ranking each population according to income and dividing into percentiles gives the proportion of individuals with an income up to that value. Figure 9 presents the percent loss in total income at each population percentile according to compensation level and group. For example, the complete removal of sickness benefits reduces the median income of the entire population from 4.51 to 4.42 million NOK. This implies that reduced compensation lowers the median income by 2.07 percent. With a fall in compensation to eighty percent, losses amount to less than one percent for all percentiles in both groups. Lower benefits have relatively little impact on total income for all parts of the population. With no benefits, the highest loss at around six percent occurs respectively at the first and bottom tenth of the entire and employed populations.

The differences in loss concentration arise due to differences in the compositions of the populations. The minimum income in the entire population of zero differs from the poorest employed individual with an income of around 670,000 NOK. The lower percentiles clearly bear the most loss in income while the richest quarter of the population experiences a negligible effect. This implies that those with low incomes



earn less income without the presence of sickness benefits than the well off who maintain relatively much of their income.

**Figure 9: Percent Loss in Total Income per Population Percentile for Entire and Employed Selection (1993-2005)**

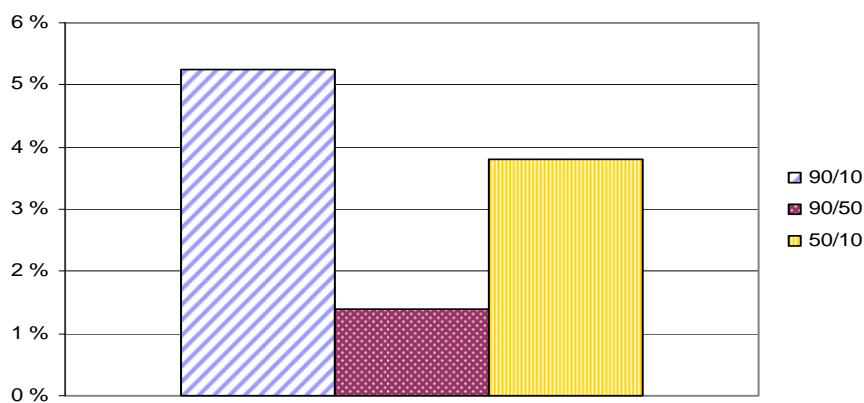


As compensation falls, the incomes for certain parts of the population do as well. Specific percentiles of the population clearly lose more income than others but this says nothing specific about the relative changes within the population. Developments in income ratios as compensation falls to eighty and zero percent describe the changes in their relative economic standings.

With reduced compensation, the degree of change of the one income in relation to the other provides an idea of the size of the relative loss. The incomes of the individuals clearly differ to begin with but do they begin to differ more as the level of benefits fall? The enforcement of an eighty percent rule has an influence well below one percent on these comparisons. In the case of no compensation, Figure 10 relays the percentage change in the ratios of total income between three of the population percentiles –the ninetieth, fiftieth and tenth. The highest increase of 5.24 percent occurs in the 90/10 ratio. This reflects an increasing difference between the economically well to-do and the lower ends of the income scale. The affluent experience a relatively improved economic standing and bear less of the loss in terms of foregone income. This corresponds with the conclusion of the Gini coefficient indicating greater income disparity. The difference between the upper tenth and the

median income increases by 1.38 percent. The median income and the lower tenth however also begin to differ more with a 3.8 percent increase in their income ratios. Both ratios to the bottom tenth show a marked increase implying a worsening of the economic situation of the tenth percentile on a general level. The already economically disadvantaged however show the opposite trend with ever decreasing and even negative ratios in some cases to their immediate percentiles. Those working part time or not at all do not face the impact of lessened benefit levels to the same extent resulting in the compression of the bottom classes economically.

**Figure 10: Percentage Change in Total Income Ratios for Population Percentiles –for Entire Selection with Zero Compensation (1993-2005)**



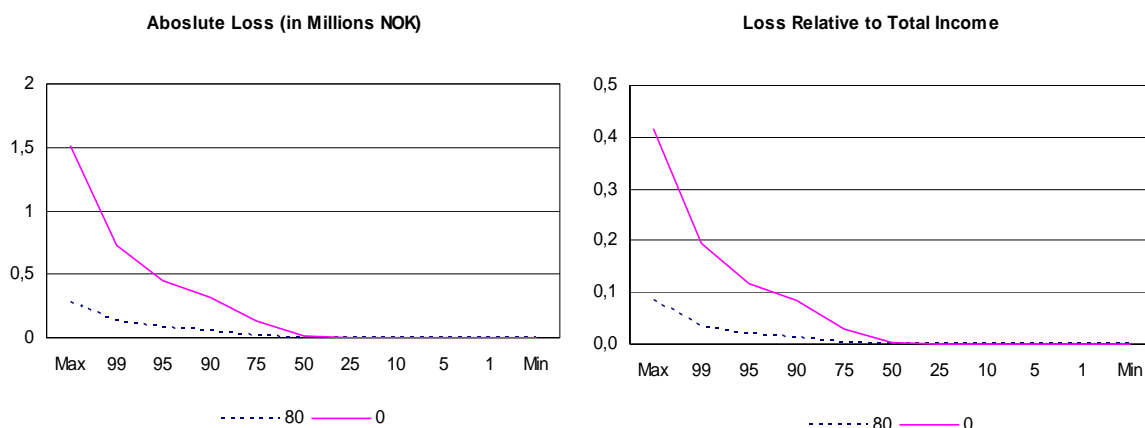
The results above reveal that a loss unimportant for the selection as a whole impacts the economic situation of a few. To examine this further I consider both the distribution of loss in absolute value and relative to total income in Figure 11. This former shows the amount lost by each individual as it occurs in the population. Given the dependence of the size of benefit payments on the working income, a high absolute loss can reflect an individual with a high wage rather than an excessive amount of sick leave. Thus I also include the ratio of this loss relative to actual total income. Both panels reveal a concentration of the highest losses to about ten percent of the population. At least half of the population remains unaffected in both instances. Implementing eighty percent compensation results in some loss concentrated to a small proportion of the population. Removing all compensation affects the same proportions of the population but to a greater extent.

With eighty percent compensation the losses remain quite low. Only ten percent of the population experiences a loss greater than 55,000 NOK. Given the time period of thirteen years this amounts to a loss of around 4,000 NOK per year. With no compensation, only ten percent of the population loses more than 325,000 NOK.

With eighty percent compensation, only ten percent lose more than one percent of their income. Ninety-five percent of the population has a loss less than two percent of their total income. The maximum loss amounts to eight percent of former income. This increases to a little more than seventy-five percent when compensation falls away completely. The maximum loss rises to 42 percent. Ninety-five percent of the population now has a loss less than 12 percent.

The total income lost amounts to relatively little for a majority of the population but for a few the losses are substantial. The foregone income constitutes a large portion of their total income but what to what income class do these total incomes belong? Not only can the concentration of large loss incur for a few individuals, but for a specific income spectrum. The top five percent of the population in terms of loss, have an average income amounting to around 350,000 NOK. The greatest loss ratio occurs at 8.5 percent for an individual with an average yearly income of 150,000 NOK. The concentration of the largest losses to a small number of individuals with low to middle incomes exhibits a definite skewness in the distribution of loss amongst the population.

**Figure 11: The Distribution of Loss amongst the Entire Population for each Level of Compensation (1993-2005)**



### 5.3 Why the small effect?

The extent to which the degree of generosity affects incomes depends not only on the rate of sick leave but the composition and distribution of sick leave occurrences as well. A five percent rate of sick leave in 2005 within the population remains fairly representative of that for Norway in 2005 of nearly six percent. A rate whose benefit payments not only depend on the number of occurrences but the distribution of sick leave among individuals and their corresponding incomes. Thus, there exist a number of possible explanations for the apparently small effect of reduced sick leave compensation on income disparity.

The length of the period studied covers a time span of thirteen years. There could arise a distribution of sick leave amongst individuals that while differing greatly with one year approaches a common rate over time. Should there exist a somewhat “random” nature to illness, an arbitrary movement of short-term sickness between individuals eventually evens out. In such a case, the importance of sickness benefits eventually plays a somewhat equal role in individual incomes over time. This would further diminish the relative size of the negative income effects of reduced compensation amongst the population. Each year would result in losses differing between individuals but more similar outcomes when considering the entire time

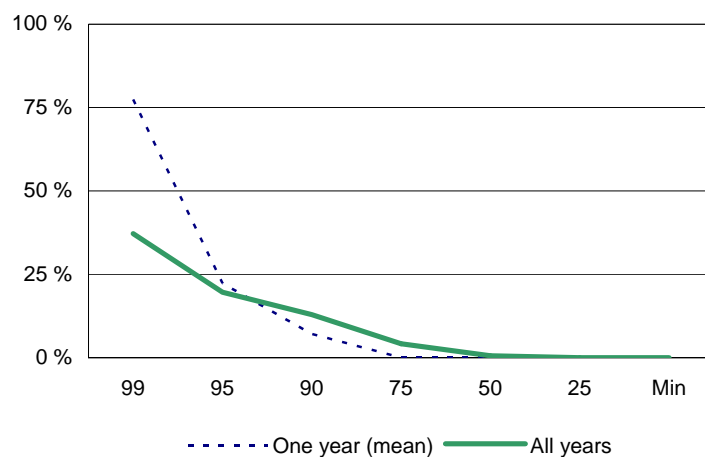
period. The final income distribution could then register the relatively little change between individuals observed here. Markussen et al (2009) find that eighty percent of employees have a certified absence rate of less than one percent due to “everyday” diseases. These minor sicknesses include respiratory infections and virus diseases. On the other hand, ten percent of the population accounts for a sick leave exceeding fifteen percent (Markussen et al, 2009). Apparently, much of the population can face similar exposure to periods of short-term sickness over time while a small portion of the population accounts for much of the greater sick leave due to more serious illnesses.

In light of this, the following figure seeks to examine the percent of the population responsible for the sick leave observed in selection. Figure 12 depicts both the average rate of sick leave with a one year and an overall perspective as occurring within the entire population. The mean yearly rate refers to the average rate of sick leave for each percentile over all the years examined. The rate for all years refers to the distribution of the average sick leave amongst the individual’s of the population as calculated from their total rate. Here one sees that regardless of the rate considered, fifty percent of the population has no sick leave episodes greater than sixteen days. Up until the ninety-fifth percentile, the average total sick leave exceeds that occurring within one year. Apparently, sick leave affects a greater number of individuals over time than when considering a single year. Average sick leave over all years also has a lower slope than that representing one year. This further implies a much more even distribution of sick leave amongst the population when considering the entire time period. This potentially reflects a distribution of sick leave such that it affects different persons within each year but with increased similarity over time.

On average, seventy-five percent of the population has a sick leave rate lower than zero percent versus fifty percent when considering total sick leave. From a shorter time perspective, less people experience a period of illness but those that do have very high rates of up to seventy-five percent. For the individuals over the entire time period, only one percent of the population has a rate exceeding thirty-seven percent.

For the top five percent of the sick leave rankings, the yearly average far exceeds that occurring in total. This indicates a constant proportion of the population absent each year for long periods of time. Long rates of sickness absences reoccur on a yearly basis but clearly for different individuals as that no singular individual has a sick leave rate nearly as high. This would seem to imply a movement over to rehabilitation or disability for those with long periods of sick leave. The yearly rate exemplifies that a small proportion of the working population accounts for much of the high sick leave rates. This concentrates the highest rates of sick leave to a few individuals. Yet, the rate of sick leave for all years reveals a more even distribution across percentiles –indicating a spread of sick leave over time between individuals and the possible exit of those most ill. The economic implications of such a development imply a distribution of loss over time between individuals and the disappearance of its heaviest users. This can contribute to the low impact on inequality found previously.

**Figure 12: Average Rate of Illness According to Population Percentiles**



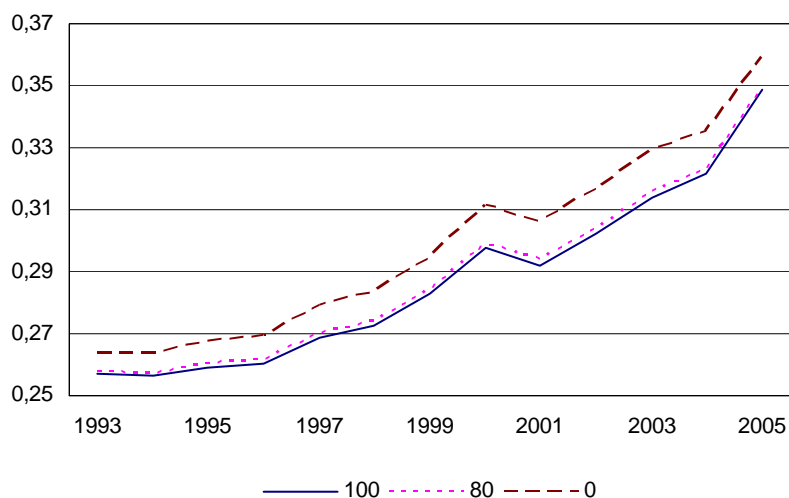
Given that a relatively large portion of the labor force possibly experiences short fluctuations in their sick leave while a small portion accounts for the long-term absences, I would expect the number of individuals receiving sickness benefits to remain fairly constant over time. The number of individuals in the entire population on sick leave benefits sometime during the year fluctuates between four and five

thousand over the thirteen year time period. This increase can also reflect the aging of the population as reflected in the rising number of individuals on disability.

Additionally, should the event of sickness have a somewhat random nature for greater parts of the population then the distribution of loss over time would also differ from that of the distribution of total loss. The implication of greater income disparity within one year in comparison to that for all years is reflected in the results. The Gini for the population increases from 0.25 to 0.35 between the years 1993 and 2005 while the Gini for the entire time period has a value of 0.25. The yearly measure also captures the increasing difference in incomes, health and aging. The weight of all these effects considered together at the end of the time period result in a far lower measure of income disparity. Yearly incomes clearly differ more than when considering income summed for all thirteen years.

The effect on these developments of a change in the compensation level naturally shifts the level of the inequality upwards as seen in Figure 13. A reduction to eighty percent compensation shows relatively little displacement of the Gini path. With no compensation the Gini still follows a similar pattern as with full compensation but to varying degrees. The yearly inequality with zero compensation differs from that of full insurance by an average of one percentage point. The greatest difference occurs in 2003 where it lays 1.5 percentage points higher. The development in inequality on a yearly basis with no compensation differs from the original case in a pattern similar to the rate of sick leave as expected.

**Figure 13: Development in the Gini Coefficient for Each Year and Compensation Level (1993-2005)**



Additionally, those with a great degree of sick leave may eventually move over to rehabilitation or disability benefits instead. About 20 percent of the cases starting with sick leave last over one year (St.Meld. Nr.9, 2006/2007). These individuals then move over to other forms of welfare when the right to sick leave benefits expires. They then constitute a group of individuals who no longer receive sickness benefits nor enter into the sick leave factor. As those most dependent on sickness insurance move over to different forms of welfare, they remain unaffected by the simulated changes. When the provision of sickness insurance no longer covers the group previously using it most, the impact of reduced compensation on inequality diminishes.





## 6. Discussion and Concluding Remarks

Norway, as a country often classified as the most generous in its sick leave provision, has a high rate of sick leave and these costs represent a formidable sum. How to handle these developments has assumed a large place in much of the present political discussion. The possible methods of reducing sick leave focus on the employer's role in providing a work environment conducive of greater work attendance and minor modifications in the rules of provision –exemplified respectively in the IA-Agreement and the 2004 reform. The latter including encouraged use of partial sick leave by physicians in their certification practices. A much less discussed alternative lies in the modification of one of the most fundamental characteristics of Norwegian sickness insurance –its full compensation. This paper has analyzed the effects of reducing the degree of compensation and its impact on income inequality amongst the individuals of a population.

The results of the analysis point towards the relatively little impact of reductions in sickness insurance on incomes and economic inequality for the populations considered. The Gini coefficient registers a slight increase despite the complete removal of sickness benefits. The complete removal of sickness insurance represents an extreme case of reduced generosity and while not the suggestion here it provides a picture of the consequences at their greatest. Total incomes naturally differ when compensation falls, yet the distribution of this loss apparently does not result in a substantial widening of income between individuals.

Analysis of the distribution of the new fictional income streams reveals that for the entire population the Gini rises by 0.12 percentage points when compensation falls to eighty percent and .83 percentage points with none. Thus while total income falls for the sample, the distribution of this loss apparently does not lead to much increased differences in incomes between individuals. Historically, full sickness insurance arose with the aim of achieving greater equality amongst the working population. Those employed all thirteen years in the sample represent a strict version of this

population. It includes individuals more alike in income and those most applicable for sickness benefits. The complete removal results in an inequality increase of 1.06 percentage points. Even the complete absence of sick leave benefits for those most reliant on its existence does not lead to greatly increased income disparity over the years examined.

The exercise itself presents a ceiling value for the possible rise in inequality as compensation falls in two ways. It assumes the individuals behave the same regardless of the compensation level. However, much literature points to the influence of reduced benefits on incentives in such a way that sick leave would actually fall. Should the reduction serve as an increased incentive to work, lower sick leave results in an even lesser utilization of sickness benefits. It then constitutes a smaller portion of an individual's income lowering the resulting income differences between individuals. The counterargument to this lies in the fact that the employees might then choose to work even when sick. This might then lead to longer sick leave later on. The study also only considers the implication of reduced benefits for sick leave greater than sixteen days. In reality, much of sickness absence may amount to a lower number of days. As such, sick leave here only captures illness lasting for longer periods of time. Yet, if many have shorter absences throughout the year, then a reduction in compensation implies lessened benefits for an increased number of people. In this paper, reduced benefits impact the incomes of only those with absences greater than sixteen days. It thus includes the longest absences, but neglects the shortest episodes. Those with lengthier sick leave experience a reduction in income lacking for those with short-term illnesses. While in reality, the reduction in compensation would apply to all sick leave including episodes less than sixteen days. In light of the findings from Markussen et al (2009) concerning the prevalence of short term sick leave of less than one percent amongst eighty percent of employees, including such absences would include loss for many of those presently registering none. While compounding the losses for the population, it might result in a more even distribution of the fictional incomes amongst the population. The present reduction only impacts those more reliant on its existence. The economic impact on a

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greater number of individuals in the population would seem to indicate a weakening of the inequality effect found here.

In the study done here, I reduce the level of compensation for the entire sick leave period. Lower compensation in the initial stages of the sick leave period rather than the entire episode could further dampen the effect on the incomes of those most often ill. Allowing for full compensation after a certain time on sick leave takes into consideration its possible economic importance for individuals in such cases. The lessened differences in income of individuals with long-term illness would most likely register a smaller increase in inequality.

The assumed static behaviour neglects two possible effects of reduced compensation on labor supply. Firstly, the hours worked would increase due to the weakened disincentive full compensation has on the willingness to work. The second option provides a slightly more diffuse conclusion. Given the transfer from long-term sick leave to rehabilitation and disability, sick leave plays a role in determining the demand for such benefits. On the one hand the number of individuals on disability might increase as the economic return of staying employed falls. Yet, given the decreased attractiveness of long-periods of illness, the sick individual might choose to return to work faster. This decreases the profitability of extended illness and the eventual movement towards a status of disability. These two affects pull in opposite directions of decreasing or increasing the labor supply.

The established connection between lessened generosity and decreased sick leave implies that such a reform would not only contribute to the goal of lowering sickness absences but also reduce welfare expenditures. Regarding the entire population in the case of no compensation, a slight increase in inequality saves the national insurance system around 6.8 billion NOK or an average of 52 million NOK per year. This in regards to the 31613 individuals followed here over a span of thirteen years. This also neglects all possible behavioral responses that might again further reduce costs.

The results depend however upon the population chosen. This paper follows the men from the age of thirty to forty-three. The increase in sick leave, rehabilitation and disability benefits amongst the men occur long before retirement age. Should this reflect the impact of an aging population, the importance of sickness benefits may increase more when considering an even older population. Additionally, this study excludes the possible inequality differences dependent upon gender. Ose et al (2006) refer to the distinct higher rate of sick leave for women. A decrease in sick leave compensation might then bear larger impact on their incomes than for men. This would result in greater inequality rises than found here as those more reliant on sickness benefits receive less. There also exist clear differences in sick leave between sectors such that reducing the level of compensation might concentrate the income effect on certain occupations. In the sample here, choosing men includes a wide range of sectors. Yet should women have an overrepresentation in some then inequality between genders might register an even further increase.

The focus on the importance of sickness insurance for equality neglects the individuals in society constituting a non-working population. Sick leave benefits apply to those holding a job or recently unemployed and as a result their existence possibly consolidates the working class while leaving the rest behind. As seen in the analysis, the degree of inequality amongst the individuals with lower income decreased as compensation fell. Fighting the relative poverty of the lowest income individuals by increasing their number hardly appears as a valid argument. But it presents the thought that in combating inequality amongst those with little income, sickness insurance plays little role. In light of budgetary and equality concerns, benefits focused on improving the relative standing of lower income individuals might have a greater positive impact on equality than the registered negative effect of reducing sickness benefits. Furthermore, if the economic consequences of reduced sick leave compensation matter as little for inequality as found, then this leaves room for the question of which welfare benefit assumes such an influential role.

The sample follows the population for thirteen years with the intent of focusing on the income effects over time. The argument for full compensation centers on its role in promoting greater income equality. The mirrored argument against lowered compensation then assumes its direct negative effect on equality. From a short term perspective the present and immediate inequality changes are correct. But a long-term view as utilized in this study reveals a softening of such a link. The results reveal that a reform of this kind has a much higher effect for a single particular year while the effect over time appears much lower.

All things considered, reduced sickness compensation enters as a possible means of both lowering the rate of sick leave and its costs without coming at the expense of economic equality.



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## References

1. Ali, Asghar (2000): "*Analyse av Sykelønnsordningen: Kan Velferdsstatlige Prinsipper Forenes Med Lavere Offentlige Utgifter?*". Master Thesis. Institute for Political Science, University of Oslo.
2. Andren, Daniela (2003): "*Sickness-Related Absenteeism and Economic Incentives In Sweden: A History of Reforms*". Report 3/2003. CESifo DICE.
3. Atkinson, Anthony B. (1991): "*Social Insurance, The Fifteenth Annual Lecture of the Geneva Association*". 16:2 113-131. The Geneva Papers on Risk and Insurance Theory.
4. Barmby, T.A., M.G. Ercolani and J.G. Treble (2002): "*Sickness Absence: An international comparison*". 112. Economic Journal.
5. Bergendorff S., S. Berggren, M. Cohen Birman, K. Nyberg, E. Palmer, P. Skogman Thoursie and J.Söderberg (2004): "*Sickness Absence in Europe – A Comparative Study*". Social Insurance studies No. 2. Swedish National Insurance Board.
6. Bjørnstad, B. (2006): "*Er det økte sykefraværet tegn på et mer inkluderende eller ekskluderende arbeidsliv?*". 6/2006. Økonomiske analyser.
7. Bjørnstad, A.F. and Solli, M. (2006): "*Utviklingen i folketrygdens utgifter til sykepenger*". Report 2006/40. Statistics Norway.
8. Burdick, James MD (2008): "*Moral Hazard and Health Care for All*". Vol 143 (NO. 10). October 2008. Arch Surg.
9. Cutler, D. and Zeckhauser, R.J., (2000): *The Anatomy of Health Insurance*. Handbook of Health Economics, Volume 1. Elsevier Science B.V.



10. Bonato L. and L. Lusinyan (2004): "*Work Absence in Europe*". WP/04/193. IMF Working Paper.
11. Eide, A. H., K.G. Hem and H. Gibb (1999): "*Sykelønnordninger i Europa*". Rapport STF78 A99536. SINTEF.
12. Eielsen, Line (2008): "*Sosiale normer som disiplinerende factor på det egenmeldte sykefraværet*". Master Thesis for the Institute of Economics. University of Oslo.
13. Hagen, K. and J. M. Hippe (1991): "*Alle vet jo at... Rapport om sykelønn og sykefravær*". Fafo rapport nr. 119. Fafo.
14. Hem, Karl-Gerhardt (2000): "*Økonomiske konsekvenser av sykefravær*". Rapport STF78 A00508. SINTEF.
15. Henrekson M., M. Persson (2004): "*The effects of sick leave of changes in the sickness insurance system*". 22(1):87–114. *Journal of Labor Economics*.
16. Hesselius P., P. Johansson and L. Larsson (2005): "*Monitoring sickness insurance claimants: evidence from a social experiment*". Working paper 2005:15. Institute for Labour Market Policy Evaluation (IFAU).
17. Johansson P. and M. Palme (2002): "*Assessing the Effect of Public Policy on Worker Absenteeism*". 37:2002:381–409. *Journal of Human Resources*.
18. Johansson P. and M. Palme (2005): "*Moral hazard and sickness insurance*". 89(2005) 1879-1890. *Journal of Public Economics*.
19. Kolstad, Arne (1999): "*Effects of Changing Government Policies on Sickness Absence Behaviour*". Report 14/99. NOVA.
20. Lindbeck A., M. Palme and M. Persson (2006): "*Job security and work absence: evidence from a natural experiment*". Seminar paper no. 743, Institute for international economic studies, Stockholm University.

- 
21. Lindbeck, Assar (1997): "*The Swedish Experiment*". Vol. 35, No.3, September. *Journal of Economic Literature*.
  22. Lusinyan, L. and Bonato, L. (2007): "*Work Absence in Europe*". 54, 475-538. *IMF Staff Papers*.
  23. Markussen, Simen (2007): "*Økonomisk sykefraværsforskning: Hva vet vi, og hvor bør vi gå?*". Søkelys på arbeidslivet, 1/2007. Institutt for samfunnsforskning.
  24. Markussen, S, K. Røed, O. Røgeberg and S. Gaure (2009): "*The Anatomy of Absenteeism*". Project "A viable welfare state".
  25. Marmot, Michael (2005): "*Social determinants of health inequalities*". Vol 365. *The Lancet*.
  26. Manning, W.G and Marquis, M.S (1996): "*Health insurance: the tradeoff between risk pooling and moral hazard*". Institute for Health Services Research. School of Public Health, University of Minnesota.
  27. McLaughlin C.G. and Chernew, M.E (2001): "*Health Insurance: Economic and Risk Aspects*". *International Encyclopedia of the Social & Behavioral Sciences*.
  28. Moene, K.O. and Wallerstein, M. (2001): "*Inequality, Social Insurance and Redistribution*". Vol.95, No. 4, December. *American Political Science Review*.
  29. NAV (2004): [URL]: <http://www.nav.no/rettskildene/rundskriv/147743.cms> [viewed 03.23.2009].
  30. NAV (2004): [URL]: <http://www.nav.no/rettskildene/rundskriv/183545.cms> [viewed 03.23.2009].
  31. NAV (2009): [URL]: <http://www.nav.no/191055.cms> [viewed 28.03.09]

32. NOU (2000): ”Sykelønnsordningen”. NOU 1990:23. Sosial- og helsedepartementet.
33. NOU (2000): ”Sykefravær og uførepensjonering. Et inkluderende arbeidsliv”. NOU 2000:27. Sosial- og helsedepartementet.
34. Ose, S. O., H. Jensberg, R. E. Reinertsen, M. Sandsund and J. M. Dyrstad (2006): ”Sykefravær. Kunnskapsstatus og problemstillinger”. Rapport A325. SINTEF.
35. Ose, S.O. (2003): “*Essays on Worker Absenteeism*”. Thesis Disertation. NTNU Trondheim.
36. Østerud, Øyvind and Aas, Atle (1996): *Statsvitenskap: innføring i politisk analyse*. [2. utg.]. Universitetsforlag , Oslo.
37. Pedersen, Axel W. (1997): ”*Fravær i arbeid: Utvikling i sykefraværet på 90-tallet*”. Rapport 218. Fafo.
38. Regjeringen (2006/2007): [URL]:  
<http://www.regjeringen.no/Rpub/STM/20062007/009/PDFS/STM200620070009000DDDPDFS.pdf> [viewed 04.22.2009].
39. Regjeringen (2008/2009): [URL]:  
<http://www.regjeringen.no/nb/dep/aid/dok/regpubl/stprp/2008-2009/stprp-nr-1-2008-2009-9/3/1.html?id=529447> [viewed 04.22.2009].
40. Shapiro C. and J.E. Stiglitz (1984): “*Equilibrium Unemployment as a Worker Discipline Device*”. 74:433–444. *The American Economic Review*.
41. Skatteetaten (2008): [URL]:  
<http://www.skatteetaten.no/Templates/TabellerOgSatser.aspx?id=8552&epslanguage=NO> [viewed 02.20.2009].

- 
42. SSB (2007): [URL]: <http://www.ssb.no/vis/magasinet/analyse/art-2007-03-13-01.html> [viewed 03.24.09].
43. SSB (2009): [URL]:  
[http://statbank.ssb.no/statistikkbanken/Default\\_FR.asp?PXSid=0&nvl=true&PLanguage=0&tilside=selectvarval/define.asp&Tabellid=03731](http://statbank.ssb.no/statistikkbanken/Default_FR.asp?PXSid=0&nvl=true&PLanguage=0&tilside=selectvarval/define.asp&Tabellid=03731) [viewed 03.24.09].
44. Theodossiou, I and Zangelidis, A. (2006): “*The Social Gradient in Health: the Effect of Absolute and Relative Income on the Individual’s Health*”. Centre for European Labour Market Research. University of Aberdeen, Business School.
45. The World Bank (2004): “*2004 World Development Indicators*”. Washington, DC. The World Bank.
46. Wikipedia (2009): [URL]: [http://en.wikipedia.org/wiki/Gini\\_index](http://en.wikipedia.org/wiki/Gini_index) [viewed 02.10.2009].
47. Zweifel, P. and Manning, W.G. (2000): *Chapter 8 Moral hazard and consumer incentives in health care*. Volume 1. Part 1. 409-459. Handbook of Health Economics.